TRANSPORTATION
AND
NATIONAL POLICY

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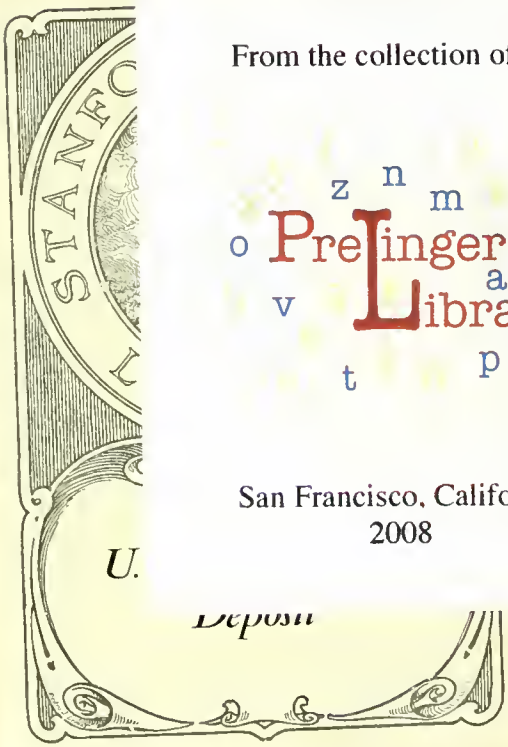
MAY 1942

NATIONAL RESOURCES PLANNING BOARD



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AND
NATIONAL POLICY

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UNITED STATES GOVERNMENT PRINTING OFFICE - - - - - - - - - - WASHINGTON : 1942

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EXECUTIVE OFFICE OF THE PRESIDENT

NATIONAL RESOURCES PLANNING BOARD

WASHINGTON, D. C.

May 25, 1942.

The PRESIDENT,

The White House.

MY DEAR MR. PRESIDENT: We have the honor to transmit herewith a report on "Transportation and National Policy" prepared in accordance with your request of January 24, 1940.

The document includes a letter of transmittal from the Honorable Owen D. Young as Chairman of the Advisory Committee for the Transportation Study; a summary report of findings and recommendations prepared by Dr. Ralph J. Watkins, Director of the Study, under the general guidance of Mr. Young; and a series of staff and agency contributions prepared by a group of specialists from both within and without the Government.

The Board is fully in accord with the view that the building of a superior and more effective transport system is a basic essential to the fuller development of our national economy. This is the most compelling of the many important conclusions issuing from the Transportation Study.

Transportation is not an end in itself, but rather the means toward many ends; and because of this its significance is magnified over and over again as its influence diffuses through the whole economy. It is for this reason that such importance must be attached to overcoming through the best possible transportation plant the obstacles which time and space impose upon the productivity of all our resources.

The report calls attention to the inadequacy of our present transportation plant, despite evidence of oversupply in the form of duplications, overlappings, and unnecessary mileage, particularly in the railroad industry; the increasing extent to which the railroads—the backbone of our transportation system—are and after the war will be increasingly subject to intense competition by air, pipe-line, water, and highway transportation. Before the present war began, this competition had already reduced many railroads to a precarious financial condition.

Adjustment by the railroads to new conditions and increasing competition by other forms of transportation is essential and will come either by the hard road of financial disaster or by broad gauge planning, consolidation, reorganization, and rebuilding in anticipation of the future. All of this planning and adjustment must consider the railroads in relation to the other modes of transportation and in relation to the needs of the country as a whole rather than to the ambitions of competing systems.

With the end of the present war, millions of men will be released from war activities. The need for employment of these men in peacetime activities will coincide with a huge demand for labor if the task of transport modernization and rebuilding which undoubtedly lies ahead is undertaken with vision, courage, and practical judgment, and on the scale which conditions demand. No better time could be found for undertaking major modernization of transport facilities.

The transportation system has its setting in a dynamic economy, and hence the problem we face is and will be a constantly changing one. No "final" solution will ever be achieved. The problem, rather, is to set up machinery and to formulate guiding principles whereby continuing adjustment can be made to new situations as they develop; to changes in the technology of transport; to changes in the character of demand for transportation service; to changes in economic organization; and finally, to changes in national policy. In recognition of this dynamic problem great emphasis must be placed on the recommendation that a permanent National Transportation Agency be established to coordinate all Federal development activities in transportation in relation to a general and progressive plan. We strongly endorse that recommendation and urge that all practicable steps be taken to translate it into action.

Plans for post-war development cannot be considered apart from the necessity of completely overhauling the basic transportation facilities of the Nation. This physical reconstruction, combined with service and policy revisions, must aim not only at modernization but at the ultimate realization of a transport industry which will permit each mode of transport its economic functioning as an integral part of the whole system. Such a system, moreover, must be encompassed in the broader plans for the entire post-war economy. Finally, the transportation policy of tomorrow must offer constant encouragement for innovation and ample opportunity to meet the needs of changing conditions to assure that transport development may at all times contribute maximum impetus to national achievement.

We have before us in the field of transportation a frontier of opportunity—the opportunity of remaking our transport plant into one commensurate with our technological possibilities and in keeping with the unfolding promise of American life. The only barriers that stand in the way are those of our habits of thinking, of our fiscal policy, and of our organizational limitations. It lies in the genius of the American people to overcome those barriers.

Respectfully submitted.

Frederic A. Delano,
Chairman.
Charles E. Merriam.
George F. Yantis.

Executive Office of the President

National Resources Planning Board

Washington, D. C.

May 22, 1942.

Mr. Frederic A. Delano,
Chairman, National Resources Planning Board,
Washington, D. C.

Dear Mr. Delano: I transmit herewith a report on "Transportation and National Policy" which has been prepared under my general guidance as Chairman of the Advisory Committee for the Transportation Study. The report consists of a summary statement of findings and recommendations on national transport development policy prepared by Dr. Ralph J. Watkins, Director of the Study, and a series of studies assembled under Dr. Watkins' direction from contributions by a staff of specialists and by agencies within the Government.

You appointed this Advisory Committee in July 1940 for advice on the transportation study which the National Resources Planning Board had undertaken in response to a request from the President. You honored me with the Chairmanship of that Committee, embracing in its membership the heads of the various Federal agencies participating in transport activities. Those who served on the Committee with me were:

George P. Baker, Member, Civil Aeronautics Board.
Joseph B. Eastman, Chairman, Interstate Commerce Commission.
Robert H. Hinckley, Assistant Secretary, Department of Commerce.
Jesse H. Jones, Federal Loan Administrator.
Rear Admiral Emory S. Land, Chairman, U. S. Maritime Commission.
Thomas H. MacDonald, Commissioner, Public Roads Administration.
Maj. Gen. Eugene Reybold, Chief of Engineers, War Department.

Major General Reybold succeeded Major General Schley on the latter's retirement on October 17, 1941. Major General Schley had served as a member of the Committee from the inception of the Study.

Four meetings of the Committee were held. Two of these were concerned with the formulation of plans for the study, and two were for the purpose of reviewing drafts of reports. One of these latter meetings was devoted to a review of an interim report prepared by the staff, and the last meeting was devoted to consideration of a draft of the final report. In addition, the staff and agency contributions were distributed to the members of the Advisory Committee for critical review, first in mimeographed form and later in galley proof. The members of the Advisory Committee were generous of their time, and they and members of their staffs devoted much time to this critical review. The authors of the reports and the Director of the Study were greatly benefited by this process of review and criticism. It must not be understood, however, that the members of the Advisory Committee necessarily endorse the views set forth in these contributions, since full liberty of expression was accorded to the individual authors and agencies.

The preparation of the summary statement of findings and recommendations represented an attempt by the Director to distill out of the several contributions findings and recommendations which would offer constructive possibilities for the future. In the nature of the case that task was not an easy one. The first draft of the summary was prepared in the fall of 1941 and was distributed to members of the Advisory Committee and the staff for criticism. On the basis of the criticisms received, the report was extensively revised and submitted as a second draft for further review. Again, in the light of the criticisms received a third draft was prepared and circulated.

The intervention of war, with its heavy demands on the time and energies of the members of the Advisory Committee and the staff, made it inopportune to hold further meetings or to devote further attention at this stage to the revision of the summary statement of findings and recommendations. Under the circumstances, therefore, it has seemed wise to submit the Director's summary and the staff and agency studies to you with the recommendation that they be published. The report is concerned with transport development policy, and it is certain that plans for facilitating the transition of the American economy from war to peace at the end of the present struggle will have to deal energetically and forthrightly with the problems of overhauling and rebuilding the basic transportation facilities of the Nation. It is highly desirable, therefore, that the analyses and policy statements contained in this report be made available as guides to thinking and as aids to planning for the America we all want to work toward in the years of peace that lie beyond the present travail of war. It is in that spirit that I submit this report to you.

Respectfully submitted.

Owen D. Young, *Chairman,*
Advisory Committee for the Transportation Study.

TRANSPORTATION AND NATIONAL POLICY

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FOREWORD

The essential objective of the Transportation Study has been to formulate the broad outlines of a transport development policy and to point ways and means of effectuating that policy.

The study was initiated in July 1940 and staff work was largely completed by July 1, 1941. A small nucleus staff was assembled by the National Resources Planning Board, consisting of transportation specialists with the ability to view the transportation problem as a whole and to understand the influence of transport on the economic and social development of the country. This staff was supplemented by staff members of the Federal agencies concerned with transportation, including the Interstate Commerce Commission, United States Maritime Commission, Public Roads Administration, Corps of Engineers, Reconstruction Finance Corporation, Civil Aeronautics Board, Department of Commerce, Department of Agriculture, Railroad Retirement Board, and others.

The report which has emerged after a year of study has attempted to examine the problems growing out of recent technological developments in transportation and to review the public and private policies which such developments have induced. What these changes signify when viewed together, particularly with respect to the relation of transport to the whole of our economic and social life, has been of considerable moment. For transportation is a primary participant with other industries in the provision of products and services they desire; and at the same time it is a major claimant with the others upon the stock of human and material resources which must in some manner be shared among them. The consequent necessity of directing transportation methods toward the best possible standards of service at the lowest cost, and at the same time of properly relating these efforts to other objectives of government, constituted the compelling need for attempting a reexamination of transport policy in a changing transport era.

The sections and chapters comprising Part I consist mainly of studies prepared by the staff, together with additional invited contributions. They undertake to present a picture of American transportation and transport policy, to analyze the issues behind transport problems, and to examine the implications of alternative policies. No effort has been made to bend the thinking of the authors to a single point of view, and indeed opposite convictions have been intentionally included; for example, in the discussions of regulatory policy. Such attempts as have been made to integrate conclusions are contained in the summary statement of findings and recommendations.

Part II consists of a series of surveys of the transport industries or of particular transport activities, prepared for the most part by representatives of the Federal transportation agencies. They are in part descriptive, but they include such views on policy matters as convey realistically a sense of what impends in transportation.

Although certain members of the staff have devoted a major share of their attention to defense and war phases of transportation, the present report is addressed to the long-range phases of transport policy and has treated only incidentally the immediate problems of war transportation. Interest has rather been in issues of a more permanent nature, and in the ultimate objective of achieving long-range policy revisions for transportation developments in the future.

ACKNOWLEDGMENTS

Without the generous cooperative efforts of all the transportation agencies in the Federal Government, this study of transport development policy would not have been possible. These agencies, as well as numerous other organizations and persons, have contributed both directly in the form of manuscripts included in the published document and indirectly through unpublished contributions, suggestions, and critical review. On behalf of the National Resources Planning Board and personally, I should like to express to all of these deep appreciation for their invaluable assistance in this difficult undertaking. Primary thanks must be extended to the members of the Advisory Committee for the Transportation Study and to The Honorable Owen D. Young, Chairman of the Committee. The members of the Committee and the agencies they represent have played an essential role through review and criticism of various segments of the report, as well as through their staff contributions. Particular thanks, therefore, are extended to the Civil Aeronautics Board, the Corps of Engineers, the Department of Commerce, the Interstate Commerce Commission, the United States Maritime Commission, the Public Roads Administration, and the Reconstruction Finance Corporation. In addition, I wish to acknowledge indebtedness to other Government agencies not represented on the Advisory Committee, including the Railroad Retirement Board, the Tennessee Valley Authority, and the Inland Waterways Corporation.

Sincere appreciation is extended to all those who have participated as authors of the various segments of the report. Recognition of the essential part which they have played in the study is attested by the presence of their work in the final document. To them goes a major share of the credit for making possible this analysis of the various elements in the transportation problem. At the same time, special mention and thanks are due the many critics who contributed valuable assistance through their painstaking review of the manuscripts.

Similar thanks are expressed on behalf of those authors who prepared segments of the interim report distributed to the Advisory Committee and others in December 1940. These contributions were for exploratory purposes rather than for publication, but their content has had an important bearing on the final product. Among those to whom grateful acknowledgment is expressed for work in these earlier phases of the study are Frank L. Barton, Tennessee Valley Authority; Cassius M. Clay, formerly of the Reconstruction Finance Corporation; Marvin L. Fair, Temple University; Prof. P. Sargant Florence, University of Birmingham, England; Kent T. Healy, Yale University; Andrew Stevenson, War Production Board; John R. Turney, of Washington, D. C.; J. P. Watson, University of Pittsburgh; and Col. William J. Wilgus, of Ascutney, Vt.

In connection with the earlier interim report, numerous comments and suggestions were made by carrier organizations, Government agencies, and individual critics. Particular mention is made of the organizations in the transport industries designated by Mr. Owen D. Young as special advisory groups. These included the Association of American Railroads, the American Short Line Railroad Association, the Lake Carriers Association, the Mississippi River Carriers Association, the National Industrial Traffic League, the American Trucking Associations, the American Petroleum Institute, and the National Association of Motor Bus Operators.

It should be noted here that acknowledgment of the help received from the members of the Advisory Committee and those others who have participated in the study, directly or indirectly, does not carry with it any responsibility for the opinions which are expressed in the transportation report, except insofar as such responsibility is indicated through authorship of specific parts of the report.

As director of the study, I must express my warmest appreciation to the transportation staff of the National Resources Planning Board which worked with me throughout the year, and to Prof. G. Shorey Peterson, of the University of Michigan, whose advice and editorial criticisms have been helpful not only to the director of the study but to the authors who have profited in no small measure by his comments. Special acknowledgment is due Messrs. Wilfred Owen and Ernest W. Williams, Jr., and Miss Marion Worthing, of the staff, who have with meritorious competence assisted in the preparation of summaries and in the editorial task; and to Maxine L. Jenson, secretary to the director of the study, who has ably handled the secretarial work involved in carrying on the study.

RALPH J. WATKINS,
Director, Transportation Study.

TRANSPORTATION AND NATIONAL POLICY
SUMMARY REPORT

Transportation: Its Status and Future

Transportation as a facilitating function of commerce is of profound importance in setting the pattern for the distribution of economic activity, in linking together resources and markets into an integrated economy, in binding together disparate areas, and in giving meaning to mobility of human resources. No better examples of these profound influences can be found than in the United States. Transportation has made possible the continental economy and cultural unity of the Nation, cementing diverse regions, resources, and peoples into an economic and cultural entity.

Because of the fundamental relationship between transportation and every phase of national well-being, the basic aim of transport policy must necessarily be maximum efficiency at minimum cost, to the end that mobility of goods and people may be assured. The transport system must comprehend all media, coordinated to assure for each its economic place. More important, it must encompass all such facilities and services as are essential to the orderly and balanced development of the Nation's resources.

The transportation problem may be described as that of bringing about such an organization of the transport industries and such a system of public regulation or control as will lead to the attainment of the objectives described above: namely, an adequate transportation system operating at a high degree of efficiency and at low cost; with each mode of transport operating in its field of greatest economy and usefulness and functioning with a minimum of waste and duplication; with a rate level which is as low as possible, yet adequate to support progressive development of transportation facilities and services and of labor standards; and with a rate structure that does not unfairly discriminate against particular persons, commodities, places, or regions, and, conversely, which grants no undue favors.

When the Transportation Act of 1920 was passed, the domestic transportation problem was principally a railroad problem, as it had been since the passage of the Act to Regulate Commerce in 1887. This early act was concerned with the protection of shippers against exorbitant or unduly discriminatory freight charges. The Act of 1920 represented a change of public policy but the problem was still a railroad problem. Emphasis merely shifted to the policy of maintaining the financial stability of the railroads, which found themselves in desperate condition principally because of the disruption in cost-revenue relationships which had developed during the war inflation and post-war deflation years.

In the two decades since 1920, there has occurred a revolution in transportation. No longer may it be said that the domestic transport problem is merely a railroad problem, or that public policy can concern itself solely with the railroads. Today the railroads, though still the backbone of the freight transportation system, are but one of the several major forms of transportation, and the problems which beset them are no longer attributable to a passing disruption of cost-revenue relationships but to the development of new and vigorous competitors. Advancing technology has promoted in the highway, waterway, pipe-line, and airway fields formidable rivals for the railway industry.

Role of Public Action

Public action has been a dominant force in the promotion of transport facilities. The content of facilities has changed with advances in technology, but always there has been the guiding policy of opening the door to whatever new mode of transport offered promise of better service or cheaper transport. At the same time, regulatory action has been directed toward developing such use of these facilities as was deemed in the public interest. Public action has produced with astonishing rapidity the most extensive system of improved highways in the world. Water transportation has experienced twentieth century revival through a system of Government-sponsored interconnected waterways. Public action has fostered a growing merchant marine by the improvement of harbors, aids to navigation, the construction of ships, and the financial support of ship operation. Air transport has been stimulated by a Nation-wide system of airports and airways, through mail payments, pilot training, safety regulation, and research. Moreover, the war has given tremendous impetus to the development of aircraft on a mass-production basis.

The magnitude of the American transportation system, including its railways and pipe lines as well as its publicly fostered facilities, provides impressive testimony of the emphasis which the Nation has placed

upon the need for transportation service. The national bill for that service is probably more than $20,000,000,000 a year, and nearly a fifth of all investments are in transportation. The Federal Government alone invests a billion dollars a year in transportation facilities.

Possibilities for the Future

The progress of the past is impressive, but the gains that lie within our grasp in the years ahead can overshadow that progress. Under the impact of a war economy we are moving toward full utilization of our man power and productive plant, and we are learning again our utter dependence on transport, the real value of the physical facilities that make up our transport plant, and the necessity of coordinated and efficient use of those facilities. What once plagued us as a surplus of transportation facilities we must now recognize at full employment of our resources as a grave shortage that imperils the attainment of war production goals. Under the conditions of war little can be done to enlarge that plant, and we shall have to rely in the main on strenuous measures aimed at getting maximum performance out of the existing plant. But the return of peace will again afford us the opportunity to build the sort of transportation plant that our unfolding technology makes possible and that effective utilization of our resources and man power demands.

In the midst of a desperate struggle that is destined to reshape the world, a struggle above all that is geared to the technologies of production and transport, no man is able to foresee the precise changes that will come in our transportation system. But it is clear even now that changes of vast import are almost certain, that with the coming of peace we shall enter upon the threshold of great developments in transport. Consider briefly some of the possibilities:

Air Transport: Not only lacing the country with passenger, express, and freight carrying airlines and private planes but circling the globe with distance shattering schedules—backed by capacity to build more than 100,000 planes a year. All the airlines in the country owned only 350 transport planes before the war and have carried from 10 to 15 percent as many passenger-miles as all the Pullman cars. Little imagination is required to picture a rapidly developing industry that will both create new transportation and make inroads upon the traffic of its competitors, especially the railroads.

Motor Transport: Resurgent after the lean years of rubber and gasoline rationing, with completely new productive capacity and new designs in automotive equipment freed from the shackles of the past; new interregional highways and urban express routes planned for construction in the transition period to take up the slack in employment.

Inland Water Transport: Expanded in scope and volume and reequipped with new and more efficient towboats and barges.

Intercoastal and Coastwise Water Transport: Restored to normal routes and augmented in tonnage by accessions from the emergency merchant fleet.

Pipe-line Transport: Expanded by the exigencies of war and backed aggressively by parent companies starved because of their dependence on more vulnerable water transport.

Railroad Transport: Flushed with the traffic gains of war through diversion and full employment and striving energetically to hold these gains against resurgent rivals.

These impending developments and competitive struggles require that we turn our thoughts now to the molding of transport development policy in order that the necessary adjustments may be made with a minimum of friction and waste. If we would seek increased mobility of goods and services and full application of transport technology, lines of public development policy must be laid out. Through advance planning under Governmental leadership the transport industries will have a rare opportunity in the post-war period to rebuild and modernize the transport plant and thereby to make a notable contribution toward solution of the stupendous problems of general economic policy in bridging the transition from war to peace.

A major objective for the future must be a lower level of rates and fares in the transport industry to place the rate structure in a more favorable position with respect to other prices, in order that restrictions on movement may be minimized. There is considerable reason to suppose that transport has been discouraged by a rate structure which fails to respond quickly to changes in economic conditions, and a rate level which may be out of line with the market possibilities of many commodities. There is danger that a permanent reduction in traffic volume may result. A reversal of present tendencies by greater economy in transport operations may vastly widen the future of transportation. Improved service, too, is an important aim for the future. Its accomplishment will result, in part, from the further application of technical developments already under way, and partly from achievement of a large measure of economic coordination.

Terminal Reconstruction.—The most neglected aspect of transport development has been the provision of terminal facilities. The antiquity of port facilities; the duplication and inefficiency in railroad freight yards and stations; the difficulties of urban truck loading and passenger car parking; and the lack of modern,

conveniently located, and properly protected airports are all familiar manifestations of the universal neglect of terminal operations. Failure to secure the possible economies of terminal unification, coordination, and modernization constitutes one of the most important reasons for high-cost rail operation. It has been estimated, for example, that approximately two-thirds of the typical completed car movement, involving about 15 days on the average, is spent within terminal areas. The fact that the terminal accounts for one-third of railroad freight operating costs emphasizes further the possibilities of terminal improvement as a means of restoring railroad profitability and reducing costs to travelers and shippers.

The growth of over-the-road trucking has created a need for joint terminal facilities which has been largely ignored. Under present conditions small and inefficient truck depots scattered indiscriminately about the cities, necessitating duplicate collection and delivery services, are sources of congestion and inconvenience to street traffic; and the absence of clearing-house service and coordination with rail and port facilities results in disproportionate terminal costs and delays. Measures of coordination would result not only in substantial improvements in trucking service, but in benefits to the entire community. Failure to recognize that off-street parking facilities must be provided to relieve traffic congestion and to insure the continued utility of motor vehicle transportation, together with inability or unwillingness of cities to adopt bold measures for alleviating the problem, have long been a source of motoring inconvenience and a barrier to efficient vehicle use.

Poor location, small sites, congestion, and other inadequacies typify a large number of airports into which much public money has been sunk. Location is often inconveniently distant from downtown business districts, and adequate provision is rarely made for highway access or transit connections. In addition, many airports are dangerously located with respect to surrounding buildings and other obstacles, making them unsatisfactory for instrument landings or even for visual approaches in bad weather. Airport congestion, too, has become a serious factor, and the need has arisen for segregation of private from commercial flying and for the provision of additional airports to accommodate increasing terminal activity.

Present-day terminal facilities are ill adjusted to general community development. They usually have a debilitating influence on real property values and the amenities of living in cities. Their operations often conflict with other functions and activities in the community. In order to eliminate or reduce to a minimum such conflicts and mutual interference, terminal facilities must be adjusted more harmoniously to the desirable present and prospective development of the community in which they are located.

Great improvements in service, better utilization of land and air rights, and the removal of many existing blighted areas would result from rebuilding terminal facilities. The objective would be, of course, to fit into the most desirable pattern of urban development a series of coordinated terminals serving all types of transport and open on equal terms to all carriers serving the area. These would replace the multiplicity of scattered facilities which have grown in and around most of our large cities in a more or less haphazard fashion and would handle rail, motor, water, and air transport within the framework of a single plan. Thus, there would be eliminated much of the wasteful transfer and hauling which occurs under existing arrangements, and the marked loss of time which results from the use of scattered facilities under diverse ownership. Central terminals would be connected with all parts of the urban area by belt rail lines and trucking facilities.

Railroad Transport.—Physical requirements involved in the modernization of railroad transportation are tremendous. In addition to the rebuilding of terminals and replacement of a large portion of the rolling stock with modern cars and more efficient locomotives, grade revision, heavier rail, reduction of curvature, electrification of dense traffic routes, and modern signal installations are necessary to permit faster and more economical operation. Light traffic branch lines have, in many areas, lost most of their economic utility and must in the long run give way to highway services. Competitive efficiency demands not only the ultimate abandonment of unnecessary lines but also the elimination of wasteful duplications of services maintained for competitive purposes.

Although public attention has been focused principally upon the outstanding technological developments in the newer fields of transport, important advances have been made on the railroads which promise continuing improvements in service and increased economy in operation. With the aid of new equipment, better yard facilities, and improved track structures, the roads have greatly accelerated their freight and passenger schedules and now offer a standard of service hitherto unequaled.

The locomotive inventory has become progressively more aged because of the small purchases of recent years, but sufficient modern locomotives have been placed in service to demonstrate excellent possibilities for economy. They are showing directly calculable savings ranging from 10 to 20 percent and more per annum on the investment. Savings result from the greater utilization possible from the modern steam loco-

motive, greatly reduced maintenance costs arising from developments in design, reduced fuel consumption, and increased hauling capacity at high speeds. In late years many roads have placed in service Diesel-electric switching locomotives which enable substantial economies in fuel, servicing, and maintenance expenses; achieve a higher degree of availability than equivalent steam power; and have a flexibility in operation that permits more rapid accomplishment of many types of switching work. In both freight and passenger service, too, the Diesel has made notable gains.

Despite the increase in average car capacity in the last two decades and the increase in loading of some commodities, car performance has been discouraging. The proportion of deadweight to revenue freight carried increased substantially, until the impact of war traffic produced far-reaching changes in car utilization. Recent developments in car construction, including the use of various light-weight materials and new methods of assembly, point to the possibility of materially reducing the tare weight of cars.

The demand for speed in modern transport service has necessitated adjustments in schedules and operating methods. Wherever possible, freight trains are now run past intermediate yards for long distances, and classification is concentrated at strategic points. The lengthening of locomotive runs has rendered many engine terminals superfluous, and both heavy and running repairs are being concentrated at principal points. Because most railroad shops were designed and equipped at least two decades ago, many of them cannot efficiently care for the larger and heavier locomotive of today. Useful economies can be secured by introducing new equipment at the larger repair points where intensive use of specialized machinery can be secured.

Commendable progress has been made in maintenance-of-way work in recent years. The rapid introduction of treated ties and heavy rails, the use of new techniques for building up battered rail ends, the rapid adoption of mechanized equipment, and the organization of specialized system rail-laying gangs are indicative of recent developments. A recent advance in permanent way has been the development of the welded rail which promises reduced maintenance costs. More significant has been the rapid development of new methods of subgrade drainage which permit more economical maintenance of line and surface.

These are but examples of the many far-reaching developments in an industry sometimes regarded as decadent. Unfortunately, the railroads have not seen fit to apply them on a broad scale during their recent period of adversity, and now that they enjoy rapidly increasing business they are unable to secure either materials or labor. Full application must await the return of peace.

Highway Transport.—The last two decades have witnessed a phenomenal growth of motor transport operations by passenger car, truck, and bus; and developments in both highway and vehicle design may be expected to continue the progress which has enabled 32,000,0000 motor vehicles to capture so significant a place in society. Important further developments in private passenger-car transportation may be expected through the safety, comfort, and economy attainable by improvements in car design. The conventional automobile of today is still but a stage in the evolution from horse and buggy; and the need is not merely for a thoroughly modern automobile, but one which can be owned and operated at a cost far lower than at present. Placing automobile engines in the rear, a practice which has been successful in bus design, promises to provide more inside space, greater safety and considerable economies in material, and the development of polarized light for headlights will permit greater night driving comfort and safety. The current conversion of the automobile industry to war production will eventually give way to a new beginning in automotive design. With extensive output of small private planes, moreover, there will be considerable incentive to design a car which can compete successfully, and which will be economical and properly adapted to the problems of short-run urban transport for which the automobile is peculiarly fitted.

In freight transportation, the use of Diesel engines, with attendant economies in operation, will mean substantial enhancement of truck performance. Extension of the use of light-weight materials for truck and trailer bodies may reduce tare weight and increase pay load. Interchangeable equipment will furnish further opportunity for coordination with rail and water transport.

Inasmuch as the motortruck shares the highway with passenger cars, the future of the truck is intimately related to motor transport as a whole. For this reason there must be a further development in engine power to permit better performance on highway grades in order to reduce the inconvenience to fast traffic which results from the excessive time and space requirements of the larger under-powered vehicle. Grade reductions and additional lanes for slow upgrade traffic may provide a solution on heavily traveled routes. Public policy with respect to the regulation of sizes and weights of motor vehicles may trend toward further relaxation of undue restrictions and greater uniformity insofar as highway design and traffic conditions will permit. On a few of the most heavily traveled routes

there may be further separation of passenger and freight traffic by the provision of parkways for the exclusive use of the passenger car or by the development of special truck routes.

Bus transportation promises to become an increasing factor in both short- and long-haul transportation. In the city the need for improved mass transportation will undoubtedly result in the further development of fast commuter bus service, and local bus lines will continue to replace the streetcar. The recent advent of air conditioning marks the approach of new standards of comfort for bus passengers. Terminal and station facilities are likewise being continually improved.

Highway facilities cannot continue to lag behind developments in the vehicle to the extent that they have in the past. Many of the most important developments in future motor transport economy and service will be of no avail without extensive modernization of the highways themselves. Although the total cost of motor transport is reflected to a preponderant extent in the cost of vehicle operation, these costs in turn reflect the type of highway facility provided. In addition, large economies in highway maintenance and in the life of the pavement result from the provision of roads which conform to the requirements of traffic density and weight. Significant economies are possible through the provision of highway capacity sufficient to minimize congestion, and through the proper application of traffic engineering principles to eliminate unnecessary stops and starts and interferences to the free flow of traffic. In the future there must be a realization of the importance of adequate grade separation structures at busy intersections, the separation of opposing traffic lanes, and the protection of traffic from encroachments of real estate development adjacent to the highway.

Water Transport.—Advances in the efficiency of operations by water carriers, both in the coasting services and on the inland waterways are evident. New types of vessels are appearing on some of the coastwise and intercoastal services. Modern construction with the latest propelling machinery, whether steam or Diesel, enables substantial economies in operation. The new designs of the United States Maritime Commission, intended principally for the foreign trade, demonstrate the possibilities for combining high speed and cubic capacity with economy of operation.

On the inland waterways, barges and towboats of recent construction show drastic changes from earlier craft. Improved hulls of electrically welded steel construction to reduce weight and permit greater cargo capacity, are streamlined to reduce resistance and enable increased speed with the same power. Twin screws have been adopted for modern towboats, providing greater maneuverability and greater speed with the same power. Finally, the Diesel engine effects fuel economies, increases cruising range, and permits the use of smaller crews.

Air Transport.—Technical advance in air transport has been phenomenally rapid. For common carrier service, larger and speedier planes have been continually introduced. Operating costs per plane-mile have increased, but costs per unit of traffic are declining. Development of larger planes, coupled with great expansion of productive facilities, promises economical cargo planes in the near future. Small planes for private use are also being designed in the lower price classes, and the ease with which they can be handled, the increasing safety factor, and the greater operating economy combine to promise a rapid growth in private plane travel.

After the war, the enormously expanded productive capacity must seek outlets in both commercial and private air transport, and reductions in first cost will greatly reduce fixed charges. The sphere for economical plane operation will expand rapidly, and the major problem will be the provision of adequate landing fields to accommodate the increasing traffic.

Distribution of Traffic.—The railway is peculiarly adapted to the carriage of goods in large quantities over considerable distances. Wherever a sufficient volume of traffic can be developed to permit efficient trainloading and a reasonable density of traffic, the railway should be able to move inland business more economically than any other type of transport, bulk movements on the Great Lakes and in the coasting trades excepted. Actual performance, however, falls short of the possibilities, largely because of a failure fully to adapt railway operations to the types of work for which they are best suited.

The future of the railroad lies in its continuance as the principal agency for heavy freight movement. The railways are capable, under a system of trainload operation and rates, of meeting much inland waterway competition, other than on the Great Lakes. Except for the waterways no agency of transport can seriously challenge them save on the shortest hauls. Most rail traffic is suited to carload operations, and where terminals are not too complex, this business may best move by rail even over short distances.

The retention of merchandise business on the rails depends primarily on the successful development of various methods of coordination. The short-haul business must be expected to gravitate to the motortruck, but severe competition may develop within a few years from air-freight service on the longer hauls. The rail-

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roads should be able to continue to offer a profitable coordinated merchandise service over routes possessing a large volume of business. Present methods of operation must, however, be revised to eliminate the wastes resulting from the multiplication of competitive services.

The motortruck is most useful in terminal services, on the shorter hauls, and over longer routes where its speed can equal or exceed that of rail operation. In the merchandise business, however, speed and flexibility of service, combined with favorable rates and minimum packing requirements make truck service especially attractive. Most less-than-carload business, except on the longest hauls, may eventually move by truck or by some form of coordinated service. In areas of light traffic density, along branch lines, and in local service along major channels of trade, the motortruck has another important place to fill.

Bus transportation has important advantages in short-distance traffic and in cross-country traffic between the major channels of movement. It also provides frequent and economical service in the light traffic areas which cannot be satisfactorily served by rail. Except on local hauls, however, good rail service can offer substantial competition.

With the channels of movement already available and maintained, the operating costs for barge operations on inland waterways, calculated on a ton-mile basis, are very low. It must be observed, however, that a large proportion of the inland water routes is circuitous relative to rail routes, and that the ton-mile figures calculated on water distances do not necessarily reflect the relative economy of water and land transport. Under favorable conditions certain types of bulk cargo can undoubtedly move more cheaply by water than by rail, and under present rate structures and methods of handling by rail, a great deal of traffic can do so. The difficulties making for high cost in coastwise shipping are, perhaps, transitory. The high cost of port operation can probably be relieved, and the advent of new tonnage may improve the situation. Bulk carriage in the coasting trade, especially of petroleum, is conducted at costs far below any available land haulage.

Pipe lines have preempted the internal movement of petroleum and natural gas, and are beginning to be used extensively for the shipment of gasoline. They have taken a large volume of business from the rail carriers, and occupy a strategic position that will probably enable them to hold their traffic. Further development is likely, including experimentation with movement of powdered bulk commodities by pipe line.

Unquestionably, air passenger traffic, especially business traffic, will continue to grow at a rapid pace, making considerable inroads on rail business. Extension of feeder service to many points which now lack air service, by the use of planes capable of getting in and out of restricted fields, will broaden the area from which airlines will draw traffic. The time is not far distant when first-class mail traffic will move exclusively by air whenever time is saved. Moreover, substantial expansion of the air express business may be expected. Costs can probably be reduced to a level substantially equivalent to present rail express rates, if volume and regularity of movement are attained. The advent of this business in volume will presage regular service by large merchandise planes. The mail and parcels business may well be extended to many small communities by means of devices for picking up and discharging traffic by planes in flight. In the more distant future the scope of air-freight operations should expand as costs are reduced and volume grows.

Recent years have witnessed a phenomenal increase in private carriage. By far the largest portion of passenger business, mostly new traffic, moves in private automobiles. Private flying has also grown rapidly but has not, as yet, attained major proportions. The effects of the private motortrucks have been keenly felt by the railroads and even by the common carrier truckers. On the inland and coastal waterways the bulk of the service is performed by private carriers, including most of the oil, much of the coal and steel, and many other bulk commodities. The unit of movement is, however, so much larger than upon the highways that comparatively few shippers can turn to private carriage.

Elements of Transport Policy

Development of an Efficient System

Wherever the allocation of resources to productive enterprises stems in the long run from consumer choices, the price system, service, and numerous other considerations play an important role. This is as true of the transport industries as of other sectors of the economy. Consequently, reliance must be placed upon the choices of the users, evidenced by their patronage of transportation services, to call forth a proper proportion of the Nation's resources into the industry, and to effect a proper allocation of these resources among the various transport media. Allocation of traffic is not accomplished by Government fiat or by arbitrary prescription, but by the free choice of consumers.

The achievement of the most economical transport system is complicated by the necessity of dealing with numerous factors in continuing and simultaneous change. The various modes of transport must be coordinated, maximum efficiency secured in the organization and operation of each individual enterprise

involved, and new media and methods be introduced at as rapid a rate as is consistent with the object of over-all economy. Meanwhile, traffic must be encouraged by rate and service structures to flow by the most economical means or combination of means existing at any stage of development.

An Economical Division of Traffic.—Each transport agency attempts to share traffic more logically belonging to another. The railroad, struggling desperately to regain its former position, attempts to retain the short-haul and less-than-carload business despite heavy terminal expenses which must often result in handling at a loss. The motortruck invades the long-haul fields by attracting the more lucrative traffic from the rails, despite the greater economy of the latter. The inland waterway diverts traffic over circuitous routes in order to share in the haul. This multiplication of overlapping services in fields of doubtful economy must, in the aggregate, account for a considerable inflation of transport cost above that which would result from a more economic division of traffic.

It is extremely difficult to ascertain cost in the transport industry applicable to any class or description of traffic because of the large group of costs which cannot definitely be assigned, and because broad descriptions of traffic may conceal real differences in comparative costs. Despite obvious difficulties study should be made to determine reasonable classifications and to estimate the costs of handling by the various types of carrier as a guide to rate policy.

Proper determination of cost involves, of course, careful choice of methods. For example, for purposes of determining comparative economy there is the question of whether any allowance should be made for costs already incurred, for these are past commitments and cannot be affected by future policy. It may be argued that only when expansion or replacement of durable facilities is required should the cost of such facilities enter into the reckoning. Differences in labor costs for comparable types of work and differences in tax policies and government promotion may also seriously affect comparative costs by the various agencies, placing some at an apparent advantage which does not, however, actually exist. Proper allowance should be made, therefore, for unequal compensation of labor, for the unequal impact of working rules, for taxes assessed for general purposes of government, and for expenditures incurred by governments in the provision of transport facilities and services.

Since the final distribution of traffic should be effected by the free choice of shippers, the rates of carriers for hire by the various means of transport should reflect, as nearly as possible, the differences in relative cost for broad areas of traffic. Each description of traffic would then go via the low-cost means or combination of means unless the shipper or traveler considered the difference in service worth the difference in cost and price. It is likely, however, that rigid adherence to cost as a basis for rate making can never be applied without the most serious repercussions upon established commercial relationships. Out-of-pocket costs should, however, control the minimum rate level, and relative costs can be useful in establishing the economic sphere of the various types of carrier.

Efficiency.—A truly economic division will proceed not alone from rates reflecting existing costs. It is also essential that costs for the various services be brought to a minimum consistent with the desired quality of service and reasonable protection of labor and capital. Much can be done to promote efficiency of operation in the various transport media. The advent of intensive competition and the severe depression of the thirties presented the railroads with new problems for which previous experience did not entirely fit them. Confronted with the immediate necessity of operating with equipment in hand they did well from an individual corporation standpoint. In preparing for the future, however, they were not entirely successful. The roads as a whole have not gone far enough in investigating new devices and improving purchasing, marketing, and operating methods. There is clear need for development of a stronger cooperative spirit in the railroad industry which will seek the solution of outstanding problems on an industry basis, rather than from the restricted point of view of individual carriers. Well-supported comprehensive research for the industry as a whole is long overdue.

Efficiency of highway operations is affected by considerations generally beyond the control of commercial operators or private users. Inadequate traffic engineering in congested urban areas often results in poor use of available facilities and produces serious losses to operators and patrons of motor vehicles.

In rural areas the most obvious source of diseconomies is the multiplicity of small governmental units participating in the highway program. In many cases the county, township, or special road district has neither the size nor wealth to support an adequate technical staff or necessary roadbuilding equipment. As a result, proper planning, budgeting, and accounting practices are often neglected; and the local road program, taken as a whole, is generally confined to maintenance operations of little consequence applied to a patchwork development. In view of these considerations there is need for greater consolidation and strengthening of the local roadbuilding function.

Other types of transport are confronted with similar problems, but on a lesser scale. The rapid develop-

ment of air transport which may be anticipated in the post-war period promises to pose serious questions, such as traffic control and organization. Continued planning should be under way to avoid the haphazard growth that has characterized other agencies.

Consolidation and Coordination.—There is much rail cooperation with respect to through routes, joint rates, trackage rights, joint use of terminals, joint switching operations, and other mutually helpful arrangements. The need for further integration, however, is urgent. The merchandise freight, express, and forwarder operations require integration in the interests of improved service and greater economy. A central clearing house to settle interline accounts and many similar devices are desirable. Finally, improvement and coordination of terminals and the elimination of wasteful competitive practices in the large terminal areas are urgently needed.

Further consolidation gives promise of substantial economies in the maintenance and operation of the railroad system. Rail consolidation should aim at the development of regional systems of such size as may be economically and efficiently organized and operated. Direct service competition should be eliminated as far as possible, and the number of separate operating companies substantially reduced. A single national system under private management is objectionable since it would place vast economic power under the control of a few and raise serious regulatory problems. Should integration proceed to that degree, government ownership and operation would seem to be the only feasible alternative.

Unfortunately, the chances of securing significant rail consolidation by voluntary means are poor. Active opposition by established carrier managements, employee groups, investors, localities likely to be affected, and other interests places difficult hurdles in the path even of minor consolidations.

Experience indicates that extensive consolidations will not be undertaken on a voluntary basis. The limitations placed upon consolidation under the Transportation Act of 1920, by the endeavor to promote competition and protect existing channels of trade, made the consolidation provisions of the Act essentially valueless, insofar as the attainment of regional unification was concerned. The fundamental change in conditions in the transport market make such limitations unnecessary today. Care should be taken, however, to avoid the formation of systems of excessive size which might encounter serious diseconomies from difficulties of organization and management.

The broader, but important, problem of coordinating the various transport media with one another has been scarcely touched. Although each type of carrier may have certain fields of operations for which it is best suited, it is possible that much traffic would move more economically by a combination of means if proper coordinating machinery were established.

Regarding the methods of securing more extensive coordination among the various types of transport, two views are dominant. One would accomplish coordination through the medium of monopolistic transport companies, presumably organized on a regional basis and under railroad auspices. These companies would have a monopoly of all common-carrier service and would utilize whatever means of transport seemed best in a given situation. It is suggested that effective regulation and the active threat of private carriage would be sufficient to hold such concerns in check, compel efficient operation, and necessitate a progressive attitude. Proponents of the second view fear the monopoly position of the transport company, the likelihood of railroad dominance, and the possibility of a lack of progressiveness. They suggest that such organization would permit, if not foster, the stifling of the newer modes of transport. Consequently, they propose that coordination arrangements be accomplished through the media of joint rates and through routes, presumably under some compulsion.

The public interest requires the establishment of a Transportation Agency independent of the Interstate Commerce Commission, to plan and promote rail consolidations and intra- and inter-agency relationships under the guidance of appropriate legislative directives. The quasi-judicial functions of regulation of rates and charges should, of course, remain with the Commission.

Finance.—No consideration of economy and efficiency in transport can ignore the requirements of wise and constructive finance. A large body of opinion considers the faulty structure of railroad capitalization to be a major cause of the industry's difficulties. It is certain that the traditional policies of railroad finance do not fit the needs of the present. The severity of competition, the rapidity of technological change, and the wide fluctuations of business activity all call for a more flexible structure with fixed charges less burdensome than those now borne by most railroads. In order to cope with changing conditions and in order to make full use of advancing technology the railroads must, moreover, be able to secure adequate capital at all times. To this end, reserves for obsolescence must be set up in connection with future increments to the capital account.

The many uncertainties and new problems which have been introduced in the transportation field necessitate increased reliance on various forms of securities

bearing charges contingent in whole or in part on earnings. Sinking funds must be provided on a more liberal scale to promote the gradual reduction of fixed interest.

Development Policy

Many years ago the objective of public promotion was simply to provide more facilities, for at that time the principal problem was the undersupply of transportation service. Today, however, the problem has shifted from one of unlimited expansion to one of coordination, greater efficiency, and the correction of inadequacies. In spite of these altered circumstances, Federal promotional policy continues to be concerned mainly with the promotion of more and more transportation capacity. Moreover, operating through separate public agencies, each acting as the special advocate of one form of transportation, the Federal Government spends an average of more than a billion dollars a year for transportation facilities without comprehensive plans.

Other deficiencies in transport promotion emphasize further the importance of examining public policy. Waste of public funds; vague and conflicting objectives; the absence of criteria to guide expenditure; and questionable methods of financing, cost allocation, and administration have all furnished evidence of serious shortcomings.

Under existing promotional policies, neither investment decisions nor the manner in which the transportation bill is paid can be said to afford an intelligent setting for an economic use of facilities or a wise application of resources. With regard to financing the fixed transportation plant, the general taxpayer pays for water and air facilities, and to a considerable extent for highways, although railroads at present receive no direct support from general taxation. When users do not pay the cost incurred by governments, as well as those which arise from the operation of vehicles utilizing government facilities, the resulting rates are lower than would otherwise be possible, producing an unequal competitive situation.

Under ordinary circumstances users should pay the full cost of public facilities, thus establishing a sounder basis for competitive relations because the cost of public facilities would be reflected in rates. In addition, user charges, furnishing government revenues on a relatively stable and predictable basis, would promote financial planning and budgeting of expenditures with due regard for traffic "earnings," thereby emphasizing economic criteria.

The introduction of user charges, furthermore, would assist investment decisions by imposing a restraint upon extravagance, since the beneficiaries of transport developments would know that responsibility for costs incurred was theirs. But user finance would provide no automatic indication of how much of our resources could economically be devoted to transportation developments. The fact that charges would be established by Government and that transportation is a necessary service would render tolls and user charges comparable to monopoly prices; and any monopoly of an essential service can exact a return far greater or less than could economically be capitalized in the enterprise. It is obvious that, under such a system of finance, it would still be necessary for public agencies to make careful calculations of costs and benefits for individual projects.

The adoption of user charges and the further development of cost and benefit calculations to guide investment might still fail to permit a realization of the relative economies of transport agencies. A potential source of inequality would be the difference in methods of determining the costs of private and of public facilities. Public financing on a pay-as-you-go basis takes no account of implicit costs corresponding to the rate of return from private investment, although user charges for public facilities may be designed to cover large capital outlays and not merely current costs. Under existing investment conditions these differences in supplying capital may balance well enough for all practical purposes to insure equity, but because of changing circumstances the ultimate solution may lie in the public ownership or leasing of all basic transport facilities, with the railroad fixed plant placed in the same category as public highways, waterways, and airways and paid for according to use. This step would establish a basis of equality in the provision of all transport facilities. Likewise, it would overcome the difficult problems arising from the railroad's burden of fixed indebtedness, for the user charge would be based on volume of traffic, thus substituting a variable for a fixed obligation. In addition it would permit more effective provision of transportation plant because it would facilitate joint use of rights-of-way and structures, coordinated terminal arrangements, and over-all plans directed to transportation requirements as a whole.

Still another advantage of public ownership or leasing of all the fixed transportation plant would be realized in connection with emergency public works programs which now apply only to highways, waterways, and airways. In the future the extension of such programs to the railroads would have the advantage not only of creating a more equitable competitive condition, but of tapping a large new reservoir of useful and needed construction projects. The tremendous task of planning adequate public works for the period of transition from

war to peace cannot be successful in the field of transportation unless it comprehends all transport media. This is the central problem of public development policy. Its solution will require social inventiveness of a high order, a willingness to face the issue, and ingenuity in contriving devices, whether they take the shape of public ownership of the railroad fixed plant, public leasing of that plant, joint public-private investment corporations, or other measures.

It may not always be desirable to finance transportation facilities on a user basis. In the first place, the principal purpose is to obtain the facilities necessary for accomplishing our national objectives, and the manner in which such facilities are financed is therefore a secondary consideration which depends upon how the ultimate goal can best be achieved. Secondly, nontransport objectives might make it impossible or unfair to charge the full cost to users. In general, however, it is believed that with such exceptions as defense needs and the development of new techniques, and new modes of transport, user charges offer the best means of financing the transportation plant.

Public promotional policy may be criticised not only because it sponsors unequal competitive conditions and uneconomic utilization of resources, but also because it fails to encourage the desirable coordination among various types of transportation plant, among the programs of the several levels of Government, and between transportation and nontransportation objectives. The logic and necessity of establishing a coordinated plan for transport promotion reinforce the case for a unified Transportation Agency.

Regulatory Policy

Until enactment of the Transportation Act of 1920, attention was focused principally on the elimination of unjust discrimination and excessive charges. The weaknesses of the railroad industry during the World War brought changes in policy that gave the Interstate Commerce Commission a more positive responsibility for the financial health and service adequacy of the carriers. The machinery provided by this act had scarcely begun to function before the advent of motor and water competition. The effects of this competition coupled with those of the severe depression of the early thirties aroused strong support for the extension of economic regulation to other types of transport. Regulation roughly comparable to that of the railroads was provided for motor carriers in 1935 and for common carrier inland waterway operators in 1940. Meanwhile a series of regulations particularly adapted to the needs of the industry was applied to airlines.

The force of competition and the application of changing regulatory standards have brought about gradual and often uneven adjustments of the rate structure. From the earliest days of regulation it has been common for communities and even for large regions of the country to allege that existing rate structures were discriminatory and deprived them of the development to which they felt entitled. The broadest of these controversies has concerned differences in rate levels prevailing in the three major classification territories which are said to place barriers in the way of economic development over the southern and western sections of the Nation.

The problems involved in this controversy are extremely difficult to evaluate. Almost every region in the country considers itself the victim of the rate structure, a partial explanation being that "discrimination" inheres in any economically practicable rate structure. Adjustments which one area calls equalization of opportunity are decried as favoritism by another. Solution of the problem obviously is one of elimination of unfair or unjust discriminations. Particular rates cannot be criticized without reference to transportation conditions and rates for similar performance elsewhere. The facts and issues require careful and objective weighing. The Transportation Act of 1940 recognizes the complexity of this problem and directs the Interstate Commerce Commission to investigate its elements and to take appropriate action to eliminate unfair discrimination against any region of the Nation. With a clear mandate from the Congress, the Commission is in position to deal with the problem in the comprehensive manner and objective spirit which a fair solution requires.

Recent extension of regulation to the newer modes of transportation has given rise to discussion of the wisdom of these steps. In evaluating regulatory policy, one group of students has directed its attention to the development of criteria for carrying out present policy. This group feels that unrestrained competition can only result in chaotic rate conditions, depressed earning power, and uneconomic duplication of facilities and services. The stabilization of the rate level is regarded as essential to the maintenance of a sound industry, and regulatory controls based upon more adequate cost knowledge are relied upon to protect the public from excessive charges. It is thought that regulation can produce essentially the same results as competition, but without the deleterious effects. Although the difficulties of administering present regulatory controls are recognized, the task is not presumed to be insuperable and its wise completion is expected to convey public benefit.

The predominant importance of developing a rate structure which recognizes the cost and service advantages of the various transport agencies necessitates the

promulgation of appropriate economic bases for the exercise of minimum rate powers. It has been suggested that rates below the out-of-pocket costs of low-cost carriers should not be permitted; that a bottom should be placed under competitive rates fixed by the cost of service of the cheapest mode of transport; and that the question of permitting high-cost carriers to meet the rates of low-cost agencies must be answered in accordance with circumstances. In no event should the high-cost carrier be permitted to go below its own out-of-pocket costs. Consideration should, however, be given to the existence of unused capacity on the part of high-cost carriers and to the desirability of securing the stimulus which results from effective competition. It is assumed, of course, that the Interstate Commerce Commission will demonstrate a high degree of capacity in adapting the general controls established by law to the various conditions encountered. The success of the regulatory policy embodied in the act of 1940 depends, according to this view, upon the wisdom of its application.

Although the Nation has adopted a policy of comprehensive regulation of all types of carriers, there is a growing body of thought which insists upon the need to reexamine economic conditions in the industry in order to appraise the existing regulatory structure and determine the direction for future policy. It has been suggested that the conditions which prompted the original railroad regulation no longer exist. Instead of danger of a railroad monopoly, competition between and within the various media has become widespread. The difficulty of regulating the numerous enterprises now engaged in transport, the rise of unregulated private carriage, and the possible necessity of further extending regulation to consolidate the controls already existing, raise the question whether it would not be more beneficial to allow larger play to competitive forces.

The lack of evidence of economies of scale in the motor-carrier industry, and to a lesser extent in inland water transport, plus the obvious incentives to efficiency which result from the competition of numerous carriers, have created doubts in some circles regarding the desirability of strict control of entry into these industries. The growth of rate bureau procedure, the restriction on individual action in rate making, the establishment of minimum rate structures on the rail basis, and the growing tendency for motor and rail carriers to agree on rate relationships, all suggest the ultimate curtailment of competition in transport and a higher cost to the users.

Although it may have appeared reasonable to regulate the competitors of the railroads in the traditional pattern or to remove some of the restraints on the railroad industry, public policy might recognize differences in the economic characteristics of the various transport media and provide regulations for each directed to its own particular characteristics. Thus, motor carrier regulation might be confined to reasonable safety, labor, and liability requirements, although most of the existing railroad controls were continued. Greater latitude might, however, be afforded the rail carriers in meeting the prices of rivals, due precaution being taken to prevent use of their greater economic power to destroy competitors. The fundamental change in the transport industry, the continuing pressure for further extension of regulation to private carriers, and the evidence of a rising rate level under comprehensive regulation make a strong case for relaxation of existing controls.

The Labor Problem

It is typical of belief in the possibility of progress that most subjects of major economic importance are characteristically described in terms of the problems they present. Labor is included among the many transportation problems. In the light of present-day standards, most students of transportation labor would grant that, in spite of set-backs, the long-time trend has been one of improvement. Thus, the recognition that collective bargaining is fundamental to good employer-employee relationship is more widespread in the United States today than at any previous time. There has been no important interruption in service in the railroad industry because of employer-employee conflicts for many years. The air transport industry is achieving a similar stability, in part by following similar practices. In water transportation there is much evidence that the violence of the thirties is being supplanted by a more orderly regime of negotiation and contract. Motor transport has also made important gains in establishing the institutions and practices that make for labor peace. The transportation industry as a whole has made its adjustments to the war program without major labor disturbances.

In the field of labor standards progress has been rapid and substantial. The 8-hour day has become the general rule in the transportation industry, while in some sections even shorter work schedules have been agreed upon. A great part of the area of wage rates is covered by labor contracts at levels which for some groups are among the best that American industry has provided. Areas of low wages have been reduced both by agreement and by regulation under Federal law. Competitive strains have been diminished through a narrowing of the differences in wage standards among the several branches of transportation. Safety standards have been steadily improved.

Some of the greatest gains for transportation labor have come in the field of legislation. The Railway Labor Act and the National Labor Relations Act have strengthened labor's collective bargaining position. The Railroad Retirement and Unemployment Insurance Acts have provided old age pensions and unemployment benefits for railroad workers. The Social Security Act has established old age and survivors insurance for industrial workers generally, including most employees in other branches of transportation. State unemployment insurance legislation includes employees in all other branches of transportation except seamen. Safety legislation, both State and Federal, has not only benefited employees, but has protected the high-standard employers from a form of unfair competition.

These gains of labor by no means represent a complete catalogue. They indicate, however, the progress which labor in the transportation industry has made. They suggest that the improvement of the processes of collective bargaining, the maintenance of high and competitively even standards of hours, wages, and working conditions, and the provision of adequate protection against economic insecurity are desirable and necessary features of a national transportation policy.

In the field of social legislation, railroad labor is more adequately provided for than most employees in other forms of transport. Consideration should be given to including seamen in the coverage of unemployment insurance, and in coordinating more equitably than is now the case Federal and State legislation as to retirement and survivor insurance and unemployment compensation. In spite of the widely admitted advantages of workmen's compensation, interstate transportation workers are still largely covered by employers' liability procedure in providing compensation for employee accidents. There are conditions peculiar to transportation which affect this problem, but such studies as have been made indicate that forms of workmen's compensation can be devised which have advantages over existing liability procedure for both employers and employees in the transportation industry.

The increasing strength of labor groups in transportation has itself given rise to problems which should be recognized in any consideration of national transportation policy. Among these are problems which spring from labor's reaction to technological and organizational improvements in the transportation industry, which, in the short run, at least, result in loss of jobs. Conflict between men and management on this point is as old as machine industry itself, and is particularly sharp in times of wide-spread unemployment.

In rail and water transportation the problem has been particularly acute. In the railroad industry labor, along with management groups, investors, and localities, has resisted coordination and consolidation measures designed to improve the service and operating performance of railroads in a manner which has made it difficult to focus attention on the merits of given coordination and consolidation plans. Legislation, likewise, has been advocated and sometimes enacted which, at best, is under the strong suspicion of being furthered in the interest of protecting jobs more than improving safety and efficiency.

No other group of transportation employees is so favorably treated with respect to protection against the effects of coordination and consolidation unemployment as railroad workers. The existence of measures of protection has not, however, abated the opposition of railroad labor organizations to coordination plans which might result in fewer jobs, irrespective of possible long run effects of an opposite character. This opposition frequently has been matched on the employer side—an opposition which for both management and labor springs from a vested interest in existing economic relationships. Where either labor or management is able to demonstrate that coordination and consolidation plans cannot be expected to result in worthwhile economic and social saving, their opposition can both be understood and supported. On the other hand, in those instances in which it can be shown that worthwhile economic and social savings will result, neither the narrower interests of labor nor of management can be allowed to stand in the way of public interest and public policy.

Full-crew legislation and train-limit legislation are of a somewhat different character. Where their primary purpose is to require more employees than are necessary for safe and efficient operations, they do not accord with sound public policy. If labor is adequately protected against unemployment, these legislative barriers are against the long-range interest of labor itself. Such measures should be judged solely on their merits as safety legislation. Management must not be prevented from organizing operations as effectively as possible, if neither the safety of employees nor of the public is endangered.

Similar principles apply to other branches of transportation. In longshore operations, there has been evidence of "slow down" on the part of labor and opposition to the introduction of labor-saving machinery and methods which is contrary to the public interest. To some extent this productivity problem has been recognized in longshore labor agreements, and labor has given indication of a desire to improve the situation. There is reason to suppose that the weapon of "slow

down" will disappear as a serious problem as collective bargaining is accepted as an essential part of a labor relations policy and as employers develop strong and intelligent industry-wide organizations for industrial relations.

The extension and authority of labor agreements in the transportation industry has given rise to many problems of interpretation of working rules, particularly in the railroad industry. Disputes over the interpretation of rules which can be handled by direct negotiation offer no difficulty. Not infrequently, however, agreement cannot be reached, and some kind of arbitration machinery is necessary. In the railroad industry the final arbiter is the National Railroad Adjustment Board, organized in several divisions and composed of equal members of representation of labor and management. If agreement on a disputed issue cannot be reached by a division of the Adjustment Board, a neutral referee is called in.

Decisions by referees frequently have been attacked, particularly when these decisions have required equivalent payments to employees in a given class of service on the ground that work to which their seniority or the working rules entitled them was performed by employees in another class of service. The subject is too technical to permit lengthy discussion. At the same time it seems clear that some of the decisions objected to cannot be defended on grounds of equity.

The Attorney General's Committee on Administrative Procedure made several recommendations in January 1941, as to Adjustment Board procedure which merit serious consideration. The Committee recommended that the Railway Labor Act be amended so that no claim filed later than 1 year following the event out of which it arose should be recognized as valid; that carrier representatives should be given opportunity to examine the submission of claimants and make formal replies to them; that the privilege of filing briefs and addressing oral arguments to the referee be permitted in all divisions of the Adjustment Board; and that the hearing of cases be expedited through use of the authority which each division of the Adjustment Board has of empowering two or more members of a division to hold hearings and recommend findings to the entire division. The Committee also suggested that a nonpartisan agency, if it could be brought into being by agreement between men and management, would prove more effective than the present bipartisan Board.

These recommendations do not, however, touch the question of the substantive character of the Board's decisions. Here is a problem for which men and management in the final instance are primarily responsible. If the rules are being interpreted in a manner displeasing to either side, the way is open to change them by negotiation under the procedures of the Railway Labor Act. The point at issue, after all, is largely the question of craft jurisdictions. Is it necessary, in order to protect established seniority rights, that no man should perform work outside his class of service under any circumstances? To observers, looking at the industry from a position of some detachment, this does not seem to be necessary. It should be possible for men and management to work out a solution in the rules which would maintain seniority rights and at the same time give management the flexibility which is required in the interests of efficient operations. The two are by no means incompatible. It should be a part of transportation policy to assist and encourage the railroad industry to work out its own solution of this problem in terms of the larger interests of labor, management, and the public.

It should also be said that it is not in the interests of the users of transportation service that rules should be interpreted in a spirit of narrow legalism. If either labor or management attempts to exact the last pound of flesh which a literal and technical interpretation seems to permit, without regard to general considerations of equity, the whole structure of collective bargaining and union agreements is weakened and endangered.

Transportation and General Policy

Because transportation is intimately geared to the workings of the whole economy, the closest interrelationship exists between transport operation and general government policies. Objectives of a broad economic nature may be attained in part through transport rates and services, and by the provision or withholding of basic facilities.

Transportation facilities, rates, and services constitute important potential tools for Government planning. For example, they are related to such problems as diffusion and diversification of industries in what are now predominantly one-industry regions; equalization of opportunities to serve markets regardless of relative transportation costs; dispersion of urban concentration; expansion of economic activities in undeveloped sections of the country; and bolstering of distressed areas. Such policies have frequently been promulgated in the past. Closely related to such programs for regional adjustments are those designed to foster particular industries. Import and export rates affect or may even nullify the foreign trade and tariff policies of the Federal Government.

Other possibilities of planning through transport activities lie in the rehabilitation of depressed sections in urban areas and the provision of housing and recreation projects which are to a considerable extent de-

pendent for their success upon transport accommodations supplied in connection with them. In addition such programs urgently require the wholesale rebuilding of city terminal areas to eliminate the blight surrounding them and to permit desirable uses for potentially valuable sites abandoned because of congested, unsightly, and unhealthy conditions. In rural areas transport development must be coordinated with appropriate land use by judicious planning of local road systems and abandonment of unnecessary mileage.

If broad reforms of this sort are to be made the object of public policy, it is apparent that transportation is related to them so directly that it can be made an instrument for achieving them. But it should be recognized that the present tenets of regulation would require great expansion to embrace those ends.

Post-War Public Works

Looking beyond the present war, it seems clear that transportation policy must be based upon the assumption that general economic policy will be directed toward the maintenance of production and national income at levels assuring substantially full employment. We must expect the national income to range upward from $100–$120 billions a year. There can be no question that the magnitudes with which transportation policy must deal will be markedly increased. This is of the greatest consequence, not only for the planning of a transportation system adequate in size to meet the new demands, but for the differential development of the various types of transportation. At high levels of production and consequently of transportation, the complementary character of the several modes of transport may become dominant over their competitive features. In an America enjoying a national income of $120 billions or more, vastly greater transport capacity will be necessary.

Transportation is closely related to public investment, and it seems clear that whatever set of policies may be determined upon to secure a full-employment level of production and income, the public investment ingredient will be greatly expanded over any previous levels, and may conceivably be relied upon as the major element of general economic policy. Moreover, the expanded public works programs of the next decades may well contain an even higher transportation element than hitherto, particularly in view of the accelerated advances in technology.

Unfortunately, plans for transportation development are hampered by the absence of appropriate machinery for coordinating the projects of the different transport agencies; and the private ownership of railroad way and structures seriously restricts the opportunity for public investment. The problem of railroad modernization, particularly in the terminal areas, requires that attention be directed immediately to ways and means of including rail projects in the post-war reconstruction program. This action is necessary also to permit an over-all approach to planning public works in transportation, and it appears logical to conclude that such matters are the proper function of a unified Transportation Agency. For largely upon the nature of the post-war projects included on the public works shelf, and upon the wisdom with which they are coordinated, will depend the realization of an adequate transportation system.

Policy Recommendations

Throughout this Summary Report, conclusions have been indicated implicitly in the nature of the discussion. In order, however, that the direction of the findings may be made explicit, salient policy recommendations have been outlined below. These recommendations naturally must be read within the context of the foregoing discussion:

I. A Unified Transportation Agency

Problem.—Though a billion dollars a year is spent by the Federal Government in the provision of transportation facilities, there is no machinery for coordinating this activity to the end of providing the most efficient transport system best adjusted to the needs of the Nation. Federal promotion of transportation operating through separate and independent agencies which act as special advocates of one medium or another is at once the most significant force in transport development and the most poorly coordinated phase of transport policy. Integration of planning and development is essential to an orderly guidance of the Federal Government's investment program.

Recommendation.—A National Transportation Agency should be established to coordinate all Federal development activity in transportation along the lines of a general and progressive plan under appropriate legislative directives. Existing development agencies would be absorbed as divisions of the new Agency. Apart from the normal development functions of these agencies, it would be the special responsibility of the Agency to undertake leadership in programs for transport consolidation, terminal unification and reconstruction, coordination of the various transport media, and encouragement of the development of new forms of transport within their respective economic spheres. Active cooperation with the regulatory agencies would be required, but the National Transportation Agency would be responsible for the unification of the Federal Government's planning, development, and administrative functions in the field of transportation.

II. Rebuilding and Coordination of Terminals

Problem.—Terminals present some of the most difficult and most neglected of transport problems. In many urban areas they have grown without plan and without attention to their effects upon land use and the general urban industrial, commercial, and residential development, and too often they symbolize urban blight. Seldom are the facilities of the various types of transport efficiently coordinated to provide the best and most economical terminal service.

Recommendation.—The planning and construction of modern, unified terminal facilities to serve a coordinated transport system is a logical public responsibility for which leadership should be undertaken by the proposed Transportation Agency. Such modern terminal areas should be provided by appropriate government action as an integral part of the city plan, their facilities open on equal terms to all suitable carriers.

III. Public Responsibility for Basic Transport Facilities

Problem.—The basic facilities for highway, waterway, and air transport are publicly provided. A strong, insistent, and pervasive public demand by a transport-conscious people has resulted in a great development of these facilities and their progressive improvement and modernization in keeping with technological progress. Although these developments are necessarily brought to a halt in the war emergency, it is abundantly clear that, with the return of peace, the shackles will be broken and a transport-rationed people will demand and secure a vastly enlarged system of highways, airways, and, to a lesser degree, waterways that will overshadow all the progress of the past.

In sharp contrast, the privately owned railway plant is in the main dependent for its modernization and improvement on access to private investment markets. No matter how antiquated these facilities may be; no matter how great the need for modernization, improvement, and rebuilding; and no matter how imperative may be the national economic need for the resuscitating influence of these developments in time of growing unemployment, the decisions must rest with managers and investors who necessarily are confined to the limits set by private finance. In consequence, the railroads are barred from participation in public works and development programs, and likewise, they are excluded from public plans embracing physical coordination with other forms of transportation.

Another condition stemming from the position of the privately owned railroad plant in a setting wherein all other basic general transport facilities are publicly provided is their unequal competitive position. In the lean years as well as the fat years, the railroads must carry a heavy burden of fixed charges while at the same time their competitors operating over public ways are subject more to variable costs which fluctuate with the volume of traffic. That these burdens have for many roads become unbearable is attested by the record of railroad bankruptcy and receivership. And even in the lean years public investment in highways, airways, and waterways grows apace, thus threatening the railroads with ever more and sharper competition. The net result of this condition has been increasingly to place railroad securities in the speculative classification. Under these circumstances there can be little assurance that capital funds will be forthcoming for a program of railway modernization and improvement commensurate with the national need in the post-war transition period.

Recommendation.—Logic and necessity suggest that the credit of the Federal Government must, by appropriate fiscal devices and under appropriate safeguards, be made available to the end that the formidable tasks of railway modernization and improvement may be included in public works programs aimed at upbuilding the country and at sustaining the national economy in the forthcoming difficult years of transition from war to peace. It must be a central task for the proposed Transportation Agency to devise suitable means.

IV. Railroad Consolidation

Problem.—Well-planned combination has been thwarted by the opposition of a multitude of interested groups, unworkable provisions of the Act of 1920, and the failure to provide authority to compel consolidation. In consequence, wasteful duplication of facilities and competing services continue. Plans for coordination and consolidation in transportation which can be shown to result in increasing the economy of operations should be furthered despite opposition from investors, labor, management, or affected communities based on a narrow vested interest in existing economic relationships.

Recommendations.—Under appropriate legislation the Transportation Agency should be empowered and directed to proceed at once with developing and carrying out plans for the economic consolidation of operating railroads. Consolidation should contemplate a limited number of systems arranged along regional lines, but avoiding systems of excessive size.

V. Highway Transport

Problem.—The rubber shortage and the conversion of automobile plants to war production make inevitable a drastic curtailment in the use and development of highway transportation equipment. At the same time, shortages in material and labor and the loss of normal sources of highway funds require a similar reduction in roadbuilding activities until after the war.

Recommendation.—War conditions provide an excellent opportunity in the highway transportation industry for the redesign of automotive equipment along functional lines; and for the planning of a modern interregional highway system and urban express routes to accommodate the automobile of the future. The highway transportation industry and the Federal and State governments should undertake now the task of assuring the restoration of motor transport after the war on a modern and efficient basis. Leadership in this program should be undertaken by the proposed Transportation Agency, with special reference to the powers inherent in the control of Federal promotional funds.

VI. Urban Highway Development

Problem.—Accidents, congestion, delays, high operating costs, and lack of accommodations which harass the movement of city traffic provide striking demonstration of the inadequacy of highway transportation in urban areas.

Recommendation.—Major emphasis in future highway development must be directed to the provision of express highways and off-street parking in urban areas. Under the guidance of the proposed Transportation Agency, the Federal-aid program and the distribution of State motor vehicle revenues to municipalities should be revised to cope adequately with the magnitude of the urban problem.

VII. Land Acquisition

Problem.—Needed development of transport facilities is frequently restricted or prevented altogether by antiquated legal procedure and inadequate financial ability which beset the States and localities in acquiring land for public purposes. This situation constitutes a primary obstacle to preparing transportation projects for a post-war program of public works.

Recommendation.—Immediate authority should be granted to permit the Federal Government to acquire and finance land acquisitions at the request of State and local governments, as well as for Federal promotional agencies. Properties acquired for State and local governments would be repurchased from the Federal Government on such terms as the proposed Transportation Agency may determine to be suitable.

VIII. Expansion of Air Transport

Problem.—The impact of war conditions upon air transport through aircraft development and production, pilot training, airport construction and other aids promises a tremendous acceleration of the industry and an enormous peacetime capacity in the post-war period.

Recommendation.—The proposed National Transportation Agency should be directed to accept the unexampled challenge of air transportation by planning in the most enlightened manner for the establishment of the new medium as a major and integral part of our future transportation system. This planning must comprehend programs for conversion of the airplane industry from war to peace, for location and construction of airports on a vastly expanded basis, for enhanced development of aids to aerial navigation, and—above all—a rational program for coordination of air transport with other forms of transportation.

IX. Regulation

Problem.—Questions have been raised regarding recent extensions of regulatory controls in the transport industry. It has been suggested that differing economic characteristics of motor and water transport make it undesirable to pattern their regulation upon established methods in the railroad industry. The danger follows that unnecessary rigidities and the encouragement of rate agreements may lead to inferior service and higher costs than would prevail from unregulated competition. The problem, in essence, is that of finding a balance between competitive forces and public controls. Public policy must insist on retention of the maximum benefits of competition in price, in service, and in flexibility consistent with the avoidance of chaos.

Recommendation.—The extended regulation under the Motor Carrier Act of 1935 and the Transportation Act of 1940 is too new to provide adequate experience on which to base a policy decision at this time. The proposed Transportation Agency should, however, undertake continuing evaluation of the economic results of present regulatory practices, including changes in the rate level, quality of service, and intensity of competition. It should examine regulatory authority and practice critically, in the light of developments in transport technology, with a view to determining whether the alternative of relaxation should be attempted; and it should make suitable recommendations to the President and the Congress for any legislation which it may consider advisable. Meanwhile, regulatory agencies should apply with caution the minimum rate and right-of-entry controls to avoid undue restriction of competitive forces.

X. Interterritorial Freight Rate Controversy

Problem.—No conceivable freight rate structure can be free of "discrimination." This condition underlies charges of discrimination against particular regions. The policy problem is that of a careful, comprehensive, and objective weighing of the freight rate structure with a view to eliminating unfair discrimination. This cannot be done in terms of specific rates in isolation but, rather, must be done with reference to transportation

conditions and rates for similar hauls elsewhere. Although discrimination among localities has been unlawful since 1887, in the Transportation Act of 1940 the Congress has specifically recognized and proscribed regional discrimination in rates, directing the Interstate Commerce Commission to study the elements of the question.

Recommendation.—The complexity of the rate structure and of the issues involved in the present controversy and the nature of the problem are such that further legislative treatment appears inadvisable. It is urged, however, that all the interested groups lend their cooperation to the Interstate Commerce Commission in order that a fair solution may be sought in an objective and dispassionate spirit. Moreover, it is to be noted that the acuteness of this problem will be alleviated with the further development of competitive agencies of transport.

XI. Labor

Problem.—Long-range considerations require greater attention to the desirability of more equitable balance among the several transport agencies in collective bargaining arrangements, labor standards, and labor legislation.

Recommendation.—The logic of nation-wide organization of transport employees requires a parallel organization of employers in each of the several branches of transportation for the conduct of industrial relations on an industry-wide basis. These industrial relations must extend far beyond the normal limits of bargaining to embrace systematic cooperation between men and management, not only for their mutual benefit but to serve the public interest in transport efficiency, service, and safety. Arrangements for negotiation between men and management, however different they may be in the various transport agencies, must be equally effective in promoting the solution of employer-employee conflicts without interruptions in transportation service. There should be a greater degree of uniformity of standards in social security legislation for the transportation industry, and greater consideration should be given to the possibility of substituting workmen's compensation procedure for the present system of employer liability. Procedures of the National Railroad Adjustment Board should be revised to accord with the recommendations and suggestions of the Attorney General's Committee on Administrative Procedure. Agreement rules which have been interpreted to require a rigidity of jurisdictional lines as between occupations should be altered to permit greater flexibility in securing economy and efficiency and in improving service without sacrificing the interests of employees in maintaining labor standards on a high and equitable level. In the interpretation of rules any attempt to substitute a narrow legalism for considerations of justice and equality should be rigorously opposed.

XII. Post-War Investment

Problem.—Inevitable readjustments following the present war will require far-reaching participation in productive investment designed to stimulate and maintain a high level of national income. Although billions of dollars have been spent in the past to provide emergency relief employment on transportation projects, results have been grossly inadequate in the light of what might have been attained.

Recommendation.—The transportation industries, properly developed and coordinated as contemplated in this report, offer some of the most promising opportunities for wise investment. Public expenditures aimed at securing lasting enhancement of the national income, however, must be carefully planned in the field of productive enterprise. Both the formulation and the execution of such plans must be the special province of the proposed Transportation Agency, to the end that the transportation industries may make their contribution toward bridging the transition between war and peace and in order that the Nation may build a transportation system commensurate with our material resources, our technological possibilities, and the resourcefulness of our people.

PART I
PROBLEMS OF TRANSPORT POLICY

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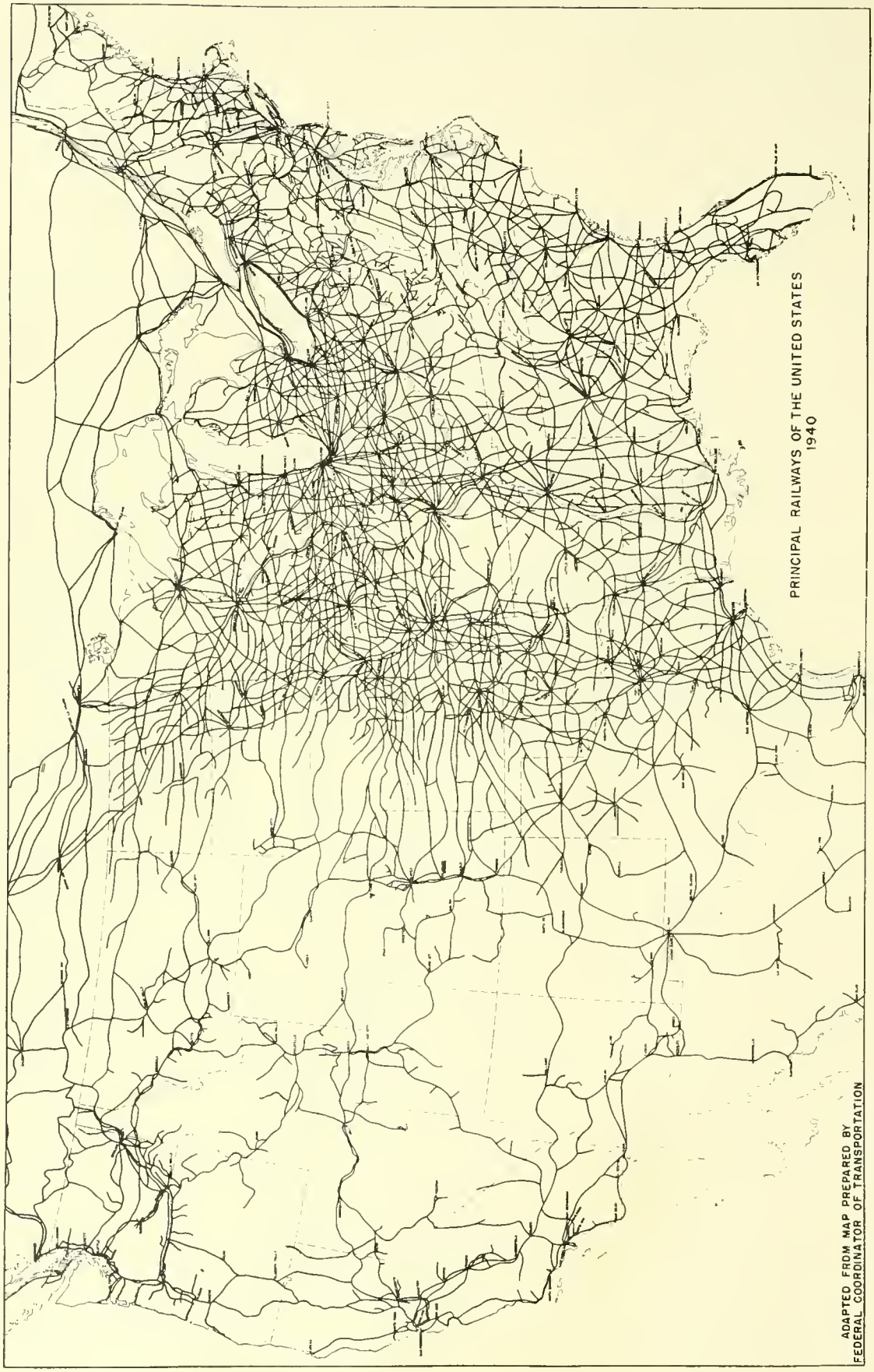
PRINCIPAL RAILWAYS OF THE UNITED STATES
1940
ADAPTED FROM MAP PREPARED BY
FEDERAL COORDINATOR OF TRANSPORTATION

FIGURE 1

PART I—SECTION I—HISTORY AND DEVELOPMENT
1. DEVELOPMENT OF TRANSPORTATION IN THE UNITED STATES

By Ernest W. Williams, Jr.[1]

In the early years of colonial development chief reliance for communication was placed upon the ocean and the navigable inland waterways. The presence of the Allegheny Barrier close to the coastal margin placed strict limitations upon extensive westward movement. Consequently trade developed inland only where waterways were to be had, and the more important commercial relations were with Europe and the West Indies.

The development of a degree of colonial solidarity in the face of British trade restrictions directed attention to the scanty internal communications and the need for more rapid connections between the colonies than were afforded by the slow packets. After the Revolution numerous stage lines began operations over the indifferent roads,[2] but practical land communication awaited more suitable highways. Capital was not generally forthcoming from government sources, hence recourse was had to turnpike construction by private corporations. The Philadelphia and Lancaster Pike, completed in 1794, was the first of importance. As the number of turnpike enterprises grew, government subsidy from State and local units was forthcoming, and by 1806 the Federal Government had begun work on the Cumberland road.[3]

Under the pressure of population growth along the seaboard and the attraction of unknown lands across the mountains a considerable westward movement developed, especially along the relatively easy route afforded by the Cumberland Gap.[4] However, when small settlements were finally established across the Alleghenies, any communication with the older settlements was infrequent, irregular, and extremely costly. Since the trans-Appalachian settlements needed the markets and products of the East in order to grow out of a purely subsistence economy, the early history of transport in the United States is largely concerned with the efforts to break through the mountain barrier and establish practical communication between the seaboard and the Ohio and Mississippi Valleys.[5]

Development of the Canal

First attention was given to the improvement of the navigable waterways and the construction of canals. Whereas wagon transport over the Lancaster Turnpike cost as much as 50 cents a hundred pounds for the 74-mile haul, it was estimated that a saving of $3 a ton could be made by construction of a canal over the route. Merchandise moving by road from Philadelphia to Pittsburgh at $100 per ton could be boated 10,000 miles on canals at that rate.[6] Existing waterways were used by canoes, arks, rafts, flatboats, and bateaux for the movement of a large portion of the internal commerce, but the upper reaches of the streams were commonly unnavigable except for the smallest craft and at great risk.

The first important canal in the United States, the Erie Canal, was completed in 1825 from Troy on the Hudson to Buffalo on Lake Erie, opening a through water route to the growing west with far-flung natural waterway connections.[7] Its early effect was to divert business from the Mississippi River route and from the ports of Philadelphia and Baltimore, laying the foundations for the commercial greatness of New York. Following the success of this enterprise other States undertook the construction of canal systems, and private corporations supplied a number of similar works, especially for the anthracite coal trade.[8]

Unfortunately, the canal, despite its manifest advantages over many routes, did not provide a solution for the problem of surmounting the Allegheny Front. Although the steamboat had appeared on the western rivers a decade after the successful navigation of the Hudson in 1807 by Fulton's "Clermont," lines of communication with the growing population across the mountains remained tenuous.[9] The trade of the inland communities was drained to New York and New Or-

[1] Economist, National Resources Planning Board.

[2] Between principal cities in the North, stages had indeed been begun somewhat earlier, and regular services were available between New York and Philadelphia by stage and ferry. See Dunbar, Seymour, *A History of Travel in America*, new ed. 1937, pp. 179–191.

[3] Young, Jeremiah Simeon, *A Political and Constitutional Study of the Cumberland Road*, chs. II and III.

[4] Dunbar, op. cit., pp. 136–138, 152 ff.

[5] MacGill, Caroline E., *History of Transportation in the U. S. before 1860*, p. 3.

[6] *American State Papers*, Miscellaneous, I, pp. 917–919.

[7] See *Supplement to the Annual Report of the State Engineer and Surveyor of the State of New York* for 1905.

[8] See Jones, C. L., *Economic History of the Anthracite-Tidewater Canals*; Bogen, Jules I., *The Anthracite Railroads*; Delaware and Hudson Co., *A Century of Progress—A History of the Delaware and Hudson Co.*; Annual Report, Philadelphia and Reading Railroad, Jan. 14, 1856, pp. 57–73.

[9] Dixon, Frank H., *Traffic History of the Mississippi River*, pp. 15, 28.

leans, and the latter assumed second rank among the ports of the United States.[10]

Advent of the Railroad

By 1825, however, the practicality of a new mode of transport far more flexible than the canal had been demonstrated. Its application began immediately. The Baltimore and Ohio Railroad was chartered in 1827 to surmount the Allegheny barrier and open a route to the Ohio River country. At about the same time the Pennsylvania State works were under way, embracing a railroad from Philadelphia to Columbia, canal to Hollidaysburg, portage railroad to Johnstown, and thence another canal to Pittsburgh.[11] They were completed in 1834 and were directed at promoting the commercial interests of Philadelphia in the effort to keep them abreast of competing ports.

Horsepower on the railroads was soon superseded by steam power. The success of the steam locomotive in Great Britain [12] led to the importation in 1829 of the "Stourbridge Lion" for service on the road of the Delaware and Hudson Canal Co.[13] The following year Peter Cooper demonstrated his "Tom Thumb" on the Baltimore and Ohio, and by 1831 the West Point Foundry of New York City had produced the "Best Friend" for the Charleston and Hamburgh.[14] Thereafter the development of steam power on American rails was rapid.[15] Means for speedy, economical internal transport had at last been found.

The period from 1830 to 1850 was one of experimentation in American railroading, both in technical matters and in the development of financial and organizational arrangements.[16] The early roads represented short, often disconnected segments, for the most part built to serve purely local interests. Nevertheless financing posed a difficult problem and necessitated resort to the corporate form of organization.[17] For a brief period it was assumed that railroads should be public highways, open to everyone who was ready to provide proper rolling stock on payment of established tolls. The impracticability of this arrangement was quickly demonstrated, and the function of carriage came to be associated with that of providing the way and structures.[18] By 1850 there were 9,021 miles of railways in operation, and through services were available between many of the important eastern cities.[19]

The Railroad System Matures

After 1850 through rail routes began to develop rapidly. In 1852 the Baltimore and Ohio reached Wheeling and made connections for the west, in 1854 the Pennsylvania commenced through all-rail service between Philadelphia and Pittsburgh,[20] and at about the same time consolidation of the numerous short lines across New York State began to form a through route from Albany to Buffalo.[21] Through connections between the Atlantic Seaboard and Chicago were available after 1853.

Once the value of the railroad had been demonstrated, all sections of the country sought opportunity to utilize its potentialities.[22] Since sufficient capital was not at once forthcoming from private sources various forms of government aid were resorted to. Cities, towns, counties, and States subscribed to railroad stock, guaranteed railroad bonds, and at times granted outright donations.[23] Disastrous results from over-extension on the part of State and local governments eventually led to constitutional provisions against aid to private corporations in many of the States.

Federal aid assumed greatest importance in the form of land grants. Beginning with the grant to the Illinois Central in 1850 [24] aid was extended to many roads which were building into new territory ahead of traffic. The western roads, particularly, were the recipients of liberal aid. Attention was early focussed upon the need for a transcontinental railroad and, under the stimulus of the Civil War with accompanying recognition of the role of transport in promoting national unity, the first transcontinental line was pushed to completion. The rails of the Central and Union Pacific

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[10] Dixon, op. cit., p. 15; Bogart, E. L., *The Economic History of the United States*, 3d ed., p. 208.

[11] Pennsylvania Railroad, *The Allegheny Portage Railroad;* Bishop, A. L., "The State Works of Pennsylvania"; *Transactions of the Connecticut Academy of Arts and Sciences*, 1907.

[12] Young, Robert, *Timothy Hackworth and the Locomotive*, chs. I, III–VI, IX–XII; Jackson, G. Gibbard, *The Book of the Locomotive*, chs. II–IV.

[13] Delaware and Hudson Company, op. cit., pp. 43–61.

[14] Derrick, Samuel Melanchthon, *Centennial History of the South Carolina Railroad*, pp. 46–51.

[15] See, for example, Warner, Paul T., *Motive Power Development upon the Pennsylvania Railroad System*, and Baldwin Locomotive Works, *History of the Baldwin Locomotive Works*.

[16] Moulton, H. G., *The American Transportation Problem*, p. 5.

[17] Berle, Adolph A., and Means, Gardiner C., *The Modern Corporation and Private Property*, pp. 12–13; Cleveland, Frederick A., and Powell, Fred Wilbur, *Railroad Finance*, pp. 50–51, 95.

[18] Locklin, D. Philip, *Economics of Transportation*, rev. ed., pp. 45–46.

[19] See Dinsmore, Curran, *American Railway Guide* 1850 for schedules of early railroad service.

[20] Pennsylvania Railroad, Annual Report, 1855. Rail connections via the Portage Road were available as early as 1852.

[21] See, for a discussion of the early development of the New York Central, Stevens, Frank Walker, *The Beginnings of the New York Central Railroad*.

[22] A ton of corn 170 miles from market was not worth moving over a common road, but when rail haulage was available its value was $22.20 (see XXV *American Railroad Journal*, 705–6, 928–9) at the then prevailing prices.

[23] See, for example, Lopata, Edwin L., *Local Aid to Railroads in Missouri;* Cleveland and Powell, op. cit., pp. 30–33, 54; McVey, Frank L., "State Aid to New York Railways," 7 *Social Economist* 101; Ripley, W. Z., *Railroads, Rates and Regulation*, pp. 35–42; Locklin, op. cit., pp. 53–63.

[24] Gates, Paul Wallace, *The Illinois Central Railroad and Its Colonization Work*, pp. 27–43.

Railroads were joined at Promontory Point, near Ogden, Utah, in 1869.[25]

In 1870 the railroad had reached a considerable degree of maturity. Its 52,922 miles of lines covered most of New England, traversed the key States of New York, New Jersey, and Pennsylvania, and crisscrossed the Middle West.[26] The South was less adequately served and the country beyond the Missouri boasted little but the single transcontinental. The railroad had superseded the canal and the turnpike and brought about the rapid decline of the river traffic.[27] It bound the country together as no other means of transport had done, it provided rapid interchange of goods and persons, and it facilitated that extensive specialization and minute division of labor which rapidly became a dominant characteristic of American industry.

Competition

Simultaneously, however, the growing transportation system gave rise to a new series of problems whose solution eventually called for pronounced Government intervention. In 1874 the Baltimore and Ohio reached Chicago. The Pennsylvania and New York Central had already consolidated through lines to that city and the Grand Trunk offered a roundabout but actively competitive route. The panic of 1873 brought in its wake protracted hard times which put a halt to railroad expansion for a time and created a temporary traffic stringency for those lines already in operation. As a result fierce warfare broke out between the trunk lines. Both freight and passenger rates were cut so severely that, at times, even out-of-pocket labor charges were not covered. The first-class rates between New York and Chicago were reduced from $1.88 to 25 cents a hundred pounds and commodity rates went as low as 12 cents.[28]

Competition of this extreme sort could not endure indefinitely. The Erie and Baltimore and Ohio roads approached bankruptcy, and safety was sought in agreements to maintain rates. Beginning in 1875 the large shippers of livestock and petroleum were granted low rates on condition that they act as "eveners," dividing their large pool of traffic among the several competing roads according to agreed ratios.[29] Two years later the Trunk Line Association was formed, with Mr. Albert Fink as its secretary. He had already had highly successful experience with pooling in the Southern Railway and Steamship Association,[30] and was able to secure excellent results with the Trunk Line pool. Traffic associations spread rapidly over the country and had considerable influence in steadying rates and distributing competitive traffic. Nevertheless the rate wars of the seventies seem to have established a definitely lower rate level.[31]

The decade from 1870 to 1880 was also notable for the great increase in the export grain trade. Following the post-war collapse of the domestic grain market and the rapid opening of new grain lands in the Middle West, an increasing proportion of the product was diverted to the ports for transport to Europe. The grain traffic began to assume for the carriers some of the importance hitherto enjoyed by the extensive livestock business. For eastbound business the roads in Central Freight Association territory came to rely largely on agricultural traffic. The growth of the grain belt brought into existence, too, the so-called granger roads with their many branches gridironing the fertile farm country of Missouri, Illinois, and Iowa, and later extending further west.[32]

Following the return of general prosperity the railroad net resumed its expansion at a rate hitherto unequalled. In 1882 and 1887 occurred two veritable crazes of promotion and speculative activity, when 11,569 and 12,983 miles, respectively, were laid down. Much of this building was in the Southwest and in the Far West. The Atchison, Topeka & Santa Fe and the Southern Pacific roads were joined at Deming, N. Mex., in 1881 to provide a second transcontinental;[33] the Northern Pacific reached the coast in 1883, and in the following year the Oregon Short Line provided an important competitor;[34] and the Great Northern and the rival Canadian Pacific were working rapidly westward to reach completion in the early nineties.[35] In the East the important systems were rounding out their lines by branch construction and extension; consolidation of important properties

[25] For detailed accounts of the building of these roads see Trottman, Nelson, *History of the Union Pacific—A Financial and Economic Survey;* White, Henry Kirke, *History of the Union Pacific Railway;* Daggett, Stuart, *Chapters on the History of the Southern Pacific*, chs. I–V.

[26] See series of maps in Johnson, Emory R., and Van Metre, Thurman W., *Principles of Railroad Transportation*, following p. 12.

[27] Not without opposition, however. See Van Metre, Thurman W., *Early Opposition to the Steam Railroad.*

[28] Moulton, op. cit., p. 7; Johnson, Emory R., and Huebner, Grover G., *Railroad Traffic and Rates*, vol. 1, pp. 296–297; Ripley, op. cit., pp. 21–27; Ringwalt, J. L., *Development of Transportation Systems in the United States*. p. 251.

[29] Johnson and Huebner, op. cit., p. 296.

[30] For a full discussion see "The Southern Railway and Steamship Association," V *Quarterly Journal of Economics*, 1891, pp. 70–94.

[31] See the discussion in Ripley, op. cit., pp. 21–33, 444.

[32] See, for example, Pearson, Henry G., *An American Railroad Builder: John Murray Forbes;* Reigel, Robert E., *The Story of the Western Railroads;* Gephart, W. F., *Transportation and Industrial Development in the Middle West.*

[33] For details of the expansion of the Santa Fe System see Bradley, Glenn D., *The Story of the Santa Fe.*

[34] Hedges, James Blaine, *Henry Villard and the Railways of the Northwest*, pp. 18–111.

[35] On the Canadian roads see Gibbon, John Murray, *Steel of Empire;* Glazebrook, George Parkin de Twenebroker, *History of Transportation in Canada.*

was proceeding rapidly;[36] the Pocohontas carriers were tapping new areas;[37] and a number of speculative parallel roads were underway. For example, the West Shore was building out of New York across the Hudson from the New York Central with Buffalo as its objective, and the Nickel Plate was being laid down close to the Lake Shore on the route from Buffalo to Chicago. Both were projected more with a view to selling out to the companies already in the field than continuing in active competition.

Water competition, too, was a factor to be reckoned with. Although the river and canal traffic had dwindled to meagre proportions, the coastwise trades and Great Lakes services continued to grow. Following the opening of the Sault Ste. Marie Canal in 1855 the ore and grain movement on the lakes began to develop with far-reaching effects upon the American industrial scene. Subsequently a large volume of water-rail business developed between North Atlantic Coast ports and points in the South and Southwest.[38] Intercoastal business via the Isthmus of Panama and via the Horn was always a factor to be taken into consideration by the transcontinental roads. Moreover, in the New York-Chicago business differential rail-water routes attained some importance in the package-freight trade.

Regulation

The Granger Movement

Important developments were underway in the legislative field, which culminated in the passage of the Act to Regulate Commerce in 1887. Some regulation had been attempted by the States prior to 1870, both through charter provisions and the establishment of State regulatory commissions. However, the rate maxima established in charters were generally higher than the carriers found it expedient to charge, and the early commissions had little control and scant power over rates, though long- and short-haul clauses were enforced in some of the States.[39] In the early seventies positive rate regulation by State laws first appeared following the Granger Movement.[40] The rapid settlement of the West, inflation during the Civil War, and the depressed business of the post-war years contributed to a drastic decline in agricultural prices. The farm groups came to associate their difficulties with the railroads, and to seek relief in the form of reduced rates.[41] It was claimed that freight rates to the East were exorbitant; that gross discriminations, especially against noncompetitive points, were practiced by the railroads; and, that through preferential rates, monopolies were given to individuals or corporations engaged in supplying coal and wood, and in buying grain. At the same time much discontent was abroad resulting from the difficulties of local government units which had overextended themselves to aid railroad construction and from the widespread losses which farmers were forced to take on railroad stock.[42]

Accordingly, between 1871 and 1874, regulatory acts were pushed through the legislatures of various western States, including Wisconsin, Minnesota, Illinois, and Iowa. Some of these acts named maximum rates and fares; others imposed the duty of determining schedules of maxima upon the railroad commissions which were set up under the acts. Prorata clauses were also included, resembling the modern long- and short-haul clauses, but much less flexible; an attempt was made to remedy the abuse of the free pass; and combination of competing lines was forbidden in an effort to promote competition.[43]

The acts were not long lived. Although the power of the States to regulate commerce was recognized in the celebrated case of *Munn* v. *Illinois*,[44] and in the so-called Granger cases,[45] a combination of circumstances brought about the early repeal of the regulation. The panic of 1873, with its long aftermath, produced unfortunate effects for the roads in Granger territory and elsewhere. It was easy to show, under the circumstances, that the plight of the roads was a direct outcome of regulation.[46] The Wisconsin law was repealed in 1874 after 2 years' trial. After the middle of the decade the increasing prosperity of the farmers diverted their attention to other matters, and the railroads were able to secure either repeal or substantial modification of the acts by the legislatures concerned.

Movement for Federal Regulation

Attention was given by the Federal Government to the same series of problems. The Windom Committee,

[36] *Transportation Routes to the Seaboard* (Windom Committee), 43d Cong., 1st sess., Senate Report 307, pt. 1, pp. 115, 241 (1874). See also recommendations of the Hepburn Committee, State of New York, Assembly, Albany (1879), vol. 5; appendix to report, pp. 4–5; and Schotter, H. W., *The Growth and Development of the Pennsylvania Railroad Co.*, pp. 125–144.

[37] See Norfolk & Western, 5th Annual Report, 1885, p. 15; 12th, 1892, p. 26; 13th, 1893, p. 25; Chesapeake and Ohio, 2d Annual Report, 1879, p. 10; Goodrich, Carter, et al., *Migration and Economic Opportunity*, pp. 94–95.

[38] See 6 I. C. C. 195, 200–204.

[39] Locklin, op. cit., pp. 202–203; Ripley, op. cit., pp. 453–454.

[40] Locklin, op. cit., p. 203; Sharfman, I. L., *The Interstate Commerce Commission*, part I, p. 15.

[41] Buck, S. J., *The Granger Movement*, pp. 13–14, 21, 24–34; Adams, C. F., "The Granger Movement," 120 *North American Review*, 394-424; Hadley, A. T., *Railroad Transportation*, pp. 130–134.

[42] Buck, op. cit., pp. 10–11.

[43] Hadley, op. cit., pp. 134–135.

[44] 94 U. S. 113 (1877).

[45] *Chicago, Burlington & Quincy R. R. Co.* v. *Iowa*, 94 U. S. 155 (1877); *Peik* v. *Chicago & North Western Ry. Co.*, 94 U. S. 164 (1877); *Winona & St. Peter R. R. Co.* v. *Blake*, 94 U. S. 180 (1877).

[46] See, however, Hadley, op. cit., pp. 135–136, where it is suggested that the Granger acts were a violation of the "laws of trade," and were themselves chiefly responsible for the plight of the railroads and the cessation of development, especially in Wisconsin.

appointed by the Senate in 1872, rendered its report in 1874 citing "insufficient facilities, unfair discriminations, and extortionate charges."[47] The Committee investigated transportation conditions carefully, and recommended competition as the chief means for abolishing existing abuses. Accordingly, it suggested one or more government-owned railroads to the seaboard to serve as regulators of the private system and the further improvement of inland waterways. Subsequent to this report great progress was made by the carriers in bringing competition under control. Railroad pools and traffic agreements spread rapidly until, by 1886, the country was well covered by them.[48] Moreover, the great anthracite combination was well under way, and consolidation was proceeding rapidly.[49]

Distrust of monopoly, as exemplified in the report of the Windom Committee and the later Hepburn Report in New York State, was but one factor in a complex situation which excited public attention in the eighties. Discrimination was rampant. In addition to the place discrimination which had been a factor in arousing the Granger Movement, personal discrimination had become widespread. The Standard Oil Co., the great steel companies, and the meat packers were chiefly involved. The latter came to serve as eveners and strengthened their position by aid of the resulting rebates. The Standard Oil practices were especially iniquitous, involving, as they did, exclusive contracts with the great trunk lines for the transport of oil to the virtual exclusion of their smaller competitors.[50] It was testified before the Hepburn Committee that few shippers had ever seen printed tariffs, and that half the New York Central business out of New York and nine-tenths of the outbound freight at Syracuse moved on special rates.[51]

While gross abuses had developed in the traffic end of the railway business, railroad financial affairs were also permeated with rank speculation and fraud. Though a few railroads had managed to steer clear of financial manipulation, speculators found ample scope for activity. With the connivance of the courts and of the State legislature, Jay Gould, Fisk, Drew, and others carried out their spectacular machinations in the Erie road;[52] construction companies flourished; and stock watering was in evidence.[53]

The growing interstate character of the railroad business had become apparent,[54] and the appropriateness—indeed, necessity—of Federal action was perceived by some Members of Congress. In 1874 a bill, having as its object the accomplishment of a general reduction in the rate level, passed the House.[55] By 1877 a bill had been framed, under the leadership of Representative Reagan, of Texas, which directed attention to discrimination.[56] A series of bills followed and, in 1884, the Senate began to take an interest. The Cullom Committee rendered its report in 1886, calling attention to the railway situation and bringing in a bill which provided for a permanent administrative commission. Since the House bills proposed to leave the elimination of abuses to the Federal courts a deadlock resulted.

At this juncture the Supreme Court handed down its decision in the celebrated case of *Wabash, St. Louis and Pacific Railway Co.* v. *Illinois*,[57] apparently contradicting its views in the Granger cases by holding that the right to regulate interstate commerce was *exclusively* a function of the Federal Government. In the face of this decision differences were speedily compromised in conference committee and the Act to Regulate Commerce was passed and became effective April 5, 1887.

Act to Regulate Commerce

The Act applied to all common carriers by railroad engaged in interstate or foreign commerce and to common carriers partly by railroad and partly by water under common control, management, or arrangement, for a continuous shipment. It created the Interstate Commerce Commission consisting of five members appointed by the President with the advice and consent of the Senate. The Commission had the power and duty to inquire into the business of common carriers and keep itself informed of the manner in which it was conducted.[58] It was to hear complaints for alleged violations of the Act, investigate the matter in dispute, and order the carriers to cease and desist from unlawful practices if such were found. Carriers were made liable under the Act for the full amount of damages, as determined by the Commission, suffered by any person as a result of violations. For enforcement the Commission might apply to the Federal court for injunction or mandamus.

Section 1 of the Act required all rates to be just and reasonable; section 2 prohibited personal discrimina-

[47] *Transportation Routes to the Seaboard*, 43d Congress, 1st Session, Senate Report 307, pt. 2, p. 71 (1874).

[48] Ripley, op. cit., pp. 446–447.

[49] Bogen, op. cit., pp. 57–63; Jones, Eliot, *The Anthracite Coal Combination in the United States*.

[50] See Tarbell, Ida M., *The History of the Standard Oil Co.*

[51] Hudson, J. F., *The Railways and the Republic*, pp. 55–106.

[52] See Adams, Charles Francis, *Chapters of Erie*.

[53] Cleveland and Powell, op. cit., chs. II and IV.

[54] See Cullom Committee Report, 49th Cong., 1st sess., Senate Report 46, pt. 1, pp. 16, 137–166.

[55] Sharfman, op. cit., p. 20.

[56] Haney, Lewis Henry, *A Congressional History of Railways in the United States, 1850–87*, pp. 288–289. The text of the act as passed by the House in 1878 is given in Haney, op. cit., pp. 293–298.

[57] 118 U. S. 557 (1886).

[58] For this purpose it was empowered to require by subpoena the presence and testimony of witnesses and the production of books and papers; and to require annual reports and prescribe uniform accounts.

tion;[59] section 3 prohibited undue preference or prejudice, section 4 contained the long- and short-haul clause[60] with provision for exception by the Commission in special cases; section 5 prohibited pooling; and section 6 required publication of rates and fares and provided that no advance in rates or fares should be made without 10 days' notice and that published tariffs must be observed.

It is clear that the Act was designed to eliminate certain of the more pronounced abuses which had grown up in the railroad industry, and that it hoped to achieve much by enforcing more effective competition. The House opinion on pooling was retained as a concession to the majority opinion of the time, which favored competition as the best means of insuring a reasonable rate level and efficient service.

Although the railroads at first manifested a cooperative spirit,[61] it early became apparent that serious difficulties stood in the way of enforcement of the law. In an effort to facilitate the elimination of vicious rebating practices, the Congress passed the amendments of 1889, which made departures from the published rates punishable by imprisonment, as well as by fine. It proved virtually impossible to obtain testimony, however, until the problem of immunity of witnesses against future prosecution was settled by the Act of 1893 and subsequent interpretation by the courts.[62] Meanwhile, procedural defects were gravely imperilling the functions of the Commission, as the courts insisted on reviewing questions, not only of law but also of fact. The average duration of cases appealed was about four years.[63] Not until 1910 was this difficulty fully overcome, when the Supreme Court itself held that the courts must confine their review to questions of constitutional power and right, and questions as to whether the administrative order was within the delegated authority under which it purported to be made.[64]

More significant than these problems was the early adverse construction placed by the courts upon the fundamental clauses which outlined the rate-making powers of the Commission. The Commission had assumed that, in the place of rates found to be unjust and unreasonable, and therefore unlawful, it could prescribe maximum reasonable rates for the future. In a series of litigations carried to the Supreme Court the Commission was deprived of this authority, and was left without adequate power to protect shippers from unreasonable rates.[65] Rates found to be unreasonable might be replaced by rates making slight changes when the whole process of examination would again be required to determine the lawfulness of the new rates.

The Combination Movement

While this "emasculation" of the law was under way, rapid developments were taking place which gave rise to additional problems. The traffic associations had resorted to agreements in lieu of pools in order to keep competition within bounds and maintain the rate level. This method of action was, however, found to contravene the Sherman Act.[66] Accordingly, by the turn of the century, a period of wholesale railroad combination was in progress.

In the East, interest centered around the ambitious "community of interest plan" in Trunk Line territory and expansion of the New Haven road's sphere of influence in New England.[67] The Pennsylvania and New York Central, leaders in Trunk Line territory, sought to control all competitors and met with a large measure of success. Jointly they acquired control of the Chesapeake & Ohio and Norfolk & Western, while the Pennsylvania bought control of the Baltimore & Ohio and through it of the Reading and Central Railroad of New Jersey.[68] With the cooperation of other properties, most of which were under Morgan control, harmony was assured.

In the West the great Harriman combination was under way, with the Union Pacific, Southern Pacific, Central Pacific, Illinois Central, and other lines under its control.[69] Shortly the great battle between Hill and Harriman for control of the Northern Pacific began and, as a result, the Great Northern and Northern

[59] ". . . if any common carrier subject to the provisions of this act shall, directly or indirectly, by any special rate, rebate, drawback, or other device, charge, demand, collect, or receive from any person or persons a greater or less compensation for any service rendered, or to be rendered, in the transportation of passengers or property, subject to the provisions of this act, than it charges, demands, collects, or receives from any other person or persons for doing for him or them a like and contemporaneous service in the transportation of a like kind of traffic under substantially similar circumstances and conditions, such common carrier shall be deemed guilty of unjust discrimination, which is hereby prohibited and declared to be unlawful."

[60] ". . . it shall be unlawful for any common carrier subject to the provisions of this act to charge or receive any greater compensation in the aggregate for the transportation of passengers or of like kind of property, under substantially similar circumstances and conditions, for a shorter than for a longer distance over the same line, in the same direction, the shorter being included within the longer distance."

[61] See Ripley, op. cit., pp. 456–457.

[62] *Brown* v. *Wolker*, 161 U. S. 591 (1896).

[63] I. C. C. *Annual Report* 1897, p. 32.

[64] 215 U. S. 452, 470 (1910).

[65] *Cincinnati, New Orleans & Texas Pacific Ry. Co.* v. *Interstate Commerce Commission*, 162 U. S. 184 (1896); *Interstate Commerce Commission* v. *Cincinnati, New Orleans and Texas Pacific Ry. Co.*, 167 U. S. 479 (1897); *Interstate Commerce Commission* v. *Northwestern Ry. Co.*, 83 Fed. 611 (1897).

[66] *United States* v. *Trans-Missouri Freight Association*, 166 U. S. 290 (1897); *United States* v. *Joint Traffic Association*, 171 U. S. 505 (1898).

[67] See 27 I. C. C. 560 (1913); 31 I. C. C. 32 (1914).

[68] *Railroad Combination in the Eastern Region*, Report of the Committee on Interstate Commerce pursuant to S. Res. 71, 76th Cong., 3d sess., Senate Report 1182 (1940), part 1, pp. 16–26; Ripley, W. Z., *Railroads: Finance and Organization*, pp. 476–484.

[69] Moody, John, *The Railroad Builders*, ch. 11.

Pacific were brought together by the Northern Securities Co. in 1902.[70] The Burlington Route was already under Hill's control and, to the South, the Gould System was in process of formation. Keystone of this combination was the Missouri Pacific.[71]

Early in the present century George Gould planned to extend his already large railroad group both east and west in an endeavor to create a complete transcontinental system. By means of the Denver & Rio Grande and Western Pacific he hoped to reach the Pacific Coast, and via the Wabash-Wheeling and Lake Erie-Western Maryland plus some new construction he hoped to bring his rails to the Atlantic. His attempt to enter Pittsburgh brought him into sharp conflict with the Pennsylvania [72] and the enormous cost of his undertakings led to their failure and the eventual dissolution of the system in 1907.[73]

Less spectacular combinations occurred everywhere throughout the railroad industry, and it appeared that competition over large areas might shortly be eliminated. The legality of the larger combinations, however, was shortly tested in the courts under the Sherman Act. The first decision of the Supreme Court on the matter forced the dissolution of the Northern Securities Co.[74] Following this decision the Pennsylvania began to take steps to dispose of some of its Baltimore & Ohio holdings.[75] Meanwhile, the Union Pacific-Southern Pacific combination was under scrutiny, and, in 1912, a unanimous decision was rendered against the company by the Supreme Court.[76]

Strengthening the Commission

At the turn of the century personal discrimination, too, was giving the carriers much concern. The Act of 1887 had proved utterly inadequate to deal with the problem. Testimony before the Industrial Commission indicated that rebating in its various forms continued to be widespread and that the revenues of the carriers were seriously impaired.[77] Accordingly, the Elkins Act of 1903 was passed, virtually without opposition, making the railroad corporations liable for prosecution and the receivers of rebates guilty of violating the law. Moreover, it prohibited departures from the published tariffs, whether or not such departures constituted discrimination. This act, plus the concerted efforts of the carriers united under the "community of interest plan," seems to have gone a long way toward eliminating personal discrimination of the more flagrant types.

In order to restore to the Commission adequate powers in the control of rates, further legislation was needed. In 1906, therefore, the Hepburn Act was passed as a compromise between House and Senate views under pressure from the President and from a public opinion aroused by recent railway scandals and the extensive combination movement. The significant experience of the Interstate Commerce Commission dates very largely from this legislation.[78] The act extended the Commission's jurisdiction to express companies, sleeping-car companies, and pipe lines (other than water and gas). Privately owned cars and numerous special services of the carriers were also brought under regulation.

The more important provisions of the act were those regarding rate making. In order to overcome the restrictions upon the Commission's powers which had grown up through court interpretation, the Commission was granted the power to prescribe a reasonable maximum rate for the future in the place of a rate found unreasonable or otherwise unlawful. In addition it was given the power to compel through routes and prescribe joint rates and divisions where the carriers refused to enter into agreement. Thirty days' notice was required for all rate changes.

The now-famous "commodities clause" of the Hepburn Act prohibited a carrier engaged in interstate commerce from transporting articles in interstate commerce which it had produced or in which it had an interest other than timber or the products thereof.[79] At the same time the penalties for rebating and similar practices were strengthened by subjecting receivers of rebates to imprisonment and to forfeiture to the United States of three times the amount of rebates.

Following the passage of this act the Commission was provided with mandatory power and the foundations were laid for the development of genuine administrative control.[80] The Commission therefore became increasingly active in removing the many irregularities in rate relationships. It was still left, however, with extremely limited control under the long- and short-haul clause. Court interpretation had shorn the clause of its

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[70] See Meyer, B. H., *A History of the Northern Securities Case.*

[71] Ripley, *Railroads: Finance and Organization*, pp. 516–524; Spearman, Frank G., *The Strategy of Great Railroads*, pp. 113–132.

[72] *Railroad Combination in the Eastern Region*, Senate Report 1182, part 1, pp. 27–59; Spearman, op. cit., pp. 93–111.

[73] Jones, Eliot, *Principles of Railway Transportation*, p. 338; *Railroad Combination in the Eastern Region*, Senate Report 1182, part 1, p. 58.

[74] 193 U. S. 197 (1904).

[75] *Railroad Combination in the Eastern Region*, Senate Report 1182, part 1 pp. 88–90.

[76] 226 U. S. 61.

[77] *Report of the Industrial Commission, 1900*, vol. IV, pp. 5–7, 129, 132, 139, 142, 150–152, 159, 273, 279, 286–297, 313–316, 460–462, 470–471, 490–494, 595–596, 683–684.

[78] Sharfman, op. cit., part 1, p. 40, and footnote 40, p. 41.

[79] Early interpretation by the courts indicated that little progress would be made in securing an effective separation, particularly in the anthracite coal trade. See *United States* v. *Delaware and Hudson Co.*, 213 U. S. 366 (1909). In later cases, however, the Supreme Court sought a more definite division of railroad and mining interests. See *United States* v. *Lehigh Valley R. R.*, 220 U. S. 257 (1911); *United States* v. *Delaware, Lackawanna and Western R. R.*, 238 U. S. 516 (1915); *United States* v. *Reading Co.*, 253 U. S. 26 (1920).

[80] Sharfman, op. cit., part 1, pp. 48–49.

effectiveness by treating the presence of railroad competition as creating substantially different "circumstances and conditions" and leaving the carriers to determine in the first instance whether conditions were essentially dissimilar.[81]

The Mann-Elkins Act of 1910 restored the effectiveness of the Commission's powers over fourth-section violations by deleting the qualifying clause "under substantially similar circumstances and conditions." Henceforth, permission would be required by carriers seeking to charge a lesser rate for a shorter than for a longer haul over the same route in the same direction. Moreover, the rail carriers, once they had reduced rates to meet water competition, could not thereafter increase them unless the proposed increase could be rested upon changes in conditions other than the disappearance of water competition.

Perhaps equally significant was the provision of the act conferring upon the Commission the right to suspend changes in rates for 120 days, either upon complaint or upon its own motion. Moreover, the period of suspension might be extended for 6 months. The burden of proof was placed upon the carriers, and the Commission was authorized to enter an appropriate order, in default of which the suspended tariffs would become effective.[82]

The Railroads in Wartime

In the period between 1905 and the opening days of the World War the railways fell upon difficult times. Faced with growing traffic, increasing operating costs, and a slowly declining rate level,[83] they were hard pressed to keep abreast of traffic needs. Though extensive and costly improvements were undertaken, particularly in the East, in both line and terminal facilities,[84] though continual additions were made to car and locomotive equipment, though improvements in design offered better and more capacious rolling stock, the roads were barely able to handle the peaks. Traffic was subjected to vexatious delays, yards were badly congested, and at times as much as 2 weeks were consumed in moving a car through the Pittsburgh terminals.

The period was largely one of intensive growth, characterized not so much by extensions into new territory as by the construction of feeder and cross lines, and the general rounding out of the railroad net. It was also the period of great expansion in the interurban electric railway field, offering for the first time significant competition for the steam roads in the passenger and fast-freight business.[85] Pipe lines, too, were increasing rapidly, having been under way since the early seventies.[86] The early lines had been in the Western Pennsylvania pools and had provided connections to tide water. By 1903 lines were being laid in Kansas, Missouri, and Oklahoma, and by 1914 the Midcontinent and Texas fields were interlaced with gathering and trunk lines.[87] By 1914 there were about 10,000 miles in operation.

With the outbreak of the Great War came the depression of 1914–15 with attendant bankruptcies, depressed earnings, and restricted expansion of physical plant. Following this brief period the demands placed upon the transport system changed abruptly. As America began to supply Europe with food and munitions and to take over markets in South America, traffic increased rapidly and placed a heavy burden upon the carriers. When, in 1916, traffic broke all previous records the railways were not physically prepared to handle it. Following the entry of the United States into the war, the carriers organized a Railroads' War Board in an effort to merge their individual and competitive efforts in the interest of maximum transportation output. Although heroic efforts were made, the roads were unable to take those drastic steps which were needed to meet the situation. The net car shortage approached 150,000 in November 1917, terminals were blocked, and freight for eastern destinations was held under load as far west as the Missouri River awaiting the lifting of embargoes by eastern lines.[88]

At length, under presidential proclamation, the railroads were taken over by the Federal Government for unified operation effective at noon December 28, 1917.[89] The administration was immediately able to take steps that had been impossible under private operation. Demurrage charges were drastically increased, service was coordinated and additional passenger train mileage eliminated, fuel shipments were zoned, and the great

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[81] *Interstate Commerce Commission* v. *Alabama Midland Railway Co.*, 168 U. S. 144 (1897).

[82] The act also established the short-lived Commerce Court, which by virtue of its restricted jurisdiction was presumed to have special abilities for dealing expeditiously with appeals from the decisions of the Commission. However, the Court failed to restrict itself to questions of law and proceeded to rejudge the facts. It was abolished in 1913. In addition, the act gave to shippers the right to route their freight and authorized the President to appoint a special commission to investigate the possibility of regulating railroad financial practices.

[83] See Moulton, op. cit., pp. 112–113. Freight rates reached an all-time low in 1916. See Parmelee, Julius H., *The Modern Railway*, p. 328.

[84] For example, the rebuilding of the Erie, the low-grade freight lines of the Pennsylvania, the new intermediate yard and engine terminal facilities and the elimination of bridge and tunnel bottlenecks on the Baltimore & Ohio, and the monumental New York terminals of the Pennsylvania.

[85] Healy, Kent T., *The Economics of Transportation in America*, pp. 16, 113.

[86] The earliest pipe lines were short gathering lines in the Venango county section leading to the rivers and to rail heads. In 1863 at least three such lines were placed in operation. See Tarbell, op. cit., vol. I, p. 17.

[87] Moulton, op. cit., pp. 702–706.

[88] See 63 *Railway Age*, 910; 64 *Railway Age*, 109–110.

[89] On wartime control see Sharfman, I. L., *The American Railroad Problem*, chs. 4–5; Cunningham, W. J., *American Railroads—Government Control and Reconstruction Policies*; Jones, op. cit., chs. XXI, XXII; Hines, Walker D., *War History of American Railroads*.

accumulation of priorities was cleared and a new system devised. As a war measure Federal control was decidedly effective in moving freight.

Reconstruction

After the Armistice, however, the Railroad Administration found itself in difficult straits. During the war period it had been compelled to revise wage scales upward, to liberalize greatly the working rules, and to negotiate national agreements. At the same time the cost of fuel and supplies had risen rapidly. Only one inadequate general rate increase of 25 percent in class rates and somewhat less in commodity rates had been made. Consequently revenues had failed to keep pace with expenses and the administration was faced with a serious deficit. Moreover the public, while willing to overlook inconveniences and deficiencies during the war period, began to demand its accustomed service as soon as the conflict was resolved.

In the face of conflicting suggestions by the carriers, railway labor, the Railroad Administration, and other groups, the Congress hesitated in returning the roads to their owners. Moreover the discussions preceding action by the Congress were of a more comprehensive nature than at any previous period,[90] and strongly pointed to the desirability of a major piece of legislation. The Act of 1920, as it finally emerged was designed to deal with two sets of problems, first, the immediate disposition of the carriers and, second, long term provisions for ordering the relations of the carriers with a view to protecting a reasonable rate of earnings and eliminating competitive wastes. It marked a distinct point of departure in the history of American railway regulation for it sought, not so much to protect consumers of transportation as had earlier legislation, as to insure adequate earnings to the carriers with a view to creating a transportation system sufficiently prosperous to offer adequate and efficient service.[91]

Throwing aside the possibility of continuing the experiment of government operation, the Congress determined to return the roads to their owners without further delay.

The unsettled conditions, coupled with the impossibility of immediately adequate readjustments of the rate structure, dictated the necessity of a six-months' guarantee period, which was accepted by most of the carriers. Provisions were also included for refunding the large indebtedness of the railroads to the government arising out of the improvements made during the control period.

[90] Healy, op. cit., p. 402.

[91] See the statement of the Chief Justice of the Supreme Court in *Dayton-Goose Creek Ry.* v. *United States*, 263 U. S. 456, 478 (1924).

The Act of 1920

The long-range provisions included a rule of rate making[92] providing that the Commission should adjust rates so that the carriers as a whole, or in rate groups, would earn, under honest and efficient management, an annual net operating income equivalent to a fair return on the value of the railway property held for and used in transportation.[93] The Commission was to determine from time to time what constituted a fair return, but initially the Congress set 5½ percent. This section did not, however, constitute a guarantee to the carriers, nor did it apply to individual carriers.

As a logical part of the rate-making system based on property values, a recapture clause was included in the act designed to accumulate a portion of the excess earnings of profitable carriers for the succor of the weak roads. Thus, one half the earnings in excess of a six-percent return in any year were to be paid to the Interstate Commerce Commission to build up a contingent fund from which loans would be made to needy carriers. The other half was to be retained in a reserve fund to meet fixed charges in years of depressed earnings.[94]

In line with the effort to create a more stable and efficient transport system, sweeping provisions regarding consolidation, extensions, and the weak-road problem were incorporated in the act. The Commission was directed to prepare and adopt a plan for consolidation of the railways into a limited number of systems with the important limitations that competition should be preserved as fully as possible, existing routes and channels of commerce should be maintained, and the systems should be so constituted as to have approximately equal earning power. The Commission was given power to approve acquisitions of control, and carriers proposing new construction were required to secure a certificate of convenience and necessity from the Commission.

The serious wartime difficulties with railroad labor marked the culmination of many years of trying experience during the period of unionization, and subsequently of relationships with mature organizations. On the eve of the war the Congress had been called upon to deal with the labor problem and did so with the passage of the Adamson 8-hour law. It was evident that permanent machinery was needed for dealing with

[92] Section 15a of the Act.

[93] Valuation by the Commission was to utilize, as far as possible, the results of valuation work already accomplished under the Valuation Act of 1913, which in turn had been enacted to meet Commission recommendations growing out of the decision of the Supreme Court regarding the general level of railroad rates. See *Smyth* v. *Ames*, 169 U. S. 466, 546, 547 (1898); also the *Minnesota Rate Cases*, 230 U. S. 434 (1913). It is to be observed that the right of a fair return could be exercised only as against regulation.

[94] Sharfman, op. cit., part 1, pp. 211–216.

labor disputes. Accordingly, a United States Railroad Labor Board was created as a board of arbitration, but without the right to issue binding decisions.[95]

Finally an important power was granted the Commission in connection with discrimination in rate making. With regulatory commissions in many of the states having jurisdiction over intrastate rates, it had frequently been true that conflict arose between the State commissions and the Interstate Commerce Commission. In the *Minnesota Rate cases*[96] and the *Shreveport cases*[97] the Supreme Court had ruled that the Commission might remove discrimination against localities in adjacent states resulting from control of rates by a State commission. In order to reinforce the rule of rate making incorporated in the act of 1920 by protecting the general rate level, a provision was included granting the Commission authority to prescribe intrastate rates when necessary to remove discrimination against interstate commerce. This provision has been broadly interpreted by courts.[98]

The Decade of the Twenties

Return to Prosperity

With the help of the guaranty period provided in the Act, and the early action of the Interstate Commerce Commission to adjust the rate level to the new conditions, the carriers managed to pass the difficult years immediately succeeding the war. The Commission found that, considering the increases in expenses during the war period and the award of increased wage rates by the Labor Board,[99] increases of 40 percent in the East, 25 percent in the South, 35 percent in the West, and 25 percent in the Mountain Pacific area were required to insure the fair return contemplated by the Act.[1] Unfortunately declining price levels and depressed business activity forced reductions of rates on various agricultural products, in part accomplished by orders of the Commission,[2] and in part by voluntary action of the carriers. At length the Commission instituted a general rate investigation and ordered a 10-percent reduction on all commodities which had not already been granted similar concessions.[3]

With dwindling revenues the carriers sought wage decreases, and appealed to the Labor Board on the grounds of inability of the carriers to pay existing scales and the declining cost of living. The Board ordered a reduction of about 12 percent in 1921 and, in the following year, ordered further reductions of some 13 percent for maintenance-of-way and shop laborers and certain other groups. On July 1 the abortive shopmens' strike began under pressure by the members. It quickly became apparent that the struggle would be lengthy and costly. Violence flared at a number of points and the carriers were hampered in the performance of transportation. In the long run, however, the shopmen lost the strike and saved only the wreckage of their organization.

Tactless handling of the matter by the Labor Board,[4] already in the bad graces of the unions by reason of its willingness to revise wage rates downward, coupled with an outbreak of bitter criticism of the majority of the Board by the labor members, paved the way for its later downfall.[5] The Railway Labor Act of 1926 set up new machinery for the settlement of disputes which continues substantially in force today.[6] During its short life the Board rendered a signal service in facilitating adjustment during a difficult period.[7]

The middle twenties were a period of relative prosperity for the railroads. Traffic grew slowly to a marked peak level in 1926, fell off slightly, and again reached high levels in 1929. The carriers were in better condition than ever before to handle traffic in volume. Lines had been rebuilt, laid with heavier rail, bridges strengthened, heavier motive power installed, and improved car equipment purchased in large quantities. Both rolling stock and plant facilities were erected on a more ample scale than hitherto. General car shortages became a thing of the past. And withal there came a pronounced increase in the physical efficiency of the railroad plant and a decided improvement in railroad services.

Consolidation

The consolidation provisions of the Act of 1920 received early and continuing attention. Faced with the duty of preparing a plan for the entire country, the Commission appointed Professor W. Z. Ripley, of Harvard University, to study the problem and recommend a plan of consolidation.[8] His report was pub-

[95] On the Labor Board see Wolf, H. D., *The Railroad Labor Board.*

[96] 230 U. S. 352 (1913).

[97] 23 I. C. C. 31 (1912); 205 Fed. 380, 391 (1913); 234 U. S. 342 (1914).

[98] *Railroad Commission of Wisconsin* v. *Chicago, Burlington & Quincy R. R. Co.*, 257 U. S. 563 (1922); *United States* v. *Louisiana*, 290 U. S. 70 (1933); *Florida* v. *United States*, 292 U. S. 1 (1934).

[99] See Miller, Sidney L., *Railway Transportation: Principles and Point of View*, pp. 861–862.

[1] *Increased Rates, 1920*, 58 I. C. C. 220, 246 (1920).

[2] *Rates on Grain, Grain Products, and Hay*, 64 I. C. C. 85 (1921). In this connection the 1925 Hoch-Smith Resolution should also be considered. A concise discussion is in Locklin, op. cit., pp. 258–260.

[3] *Reduced Rates, 1922*, 68 I. C. C. 676 (1922).

[4] See Healy, op. cit., p. 340. See also criticism of Chairman Hooper in Wolf, op. cit., pp. 375–377.

[5] Miller, op. cit., p. 865.

[6] See part II, section VII, of this report for full discussion.

[7] One student of the matter states that, though the Board did not function perfectly, it served a tremendous purpose by reducing labor conflict in the railroad field to a minimum. He doubts that another plan would have succeeded as well. Miller, op. cit., p. 871.

[8] See *Railroad Combination in the Eastern Region*, Senate Report 1182, part 2, pp. 541–560.

lished by the Commission, which also announced some changes in presenting its own tentative plan.[9] The intention apparently was to stimulate thinking and discussion in preparation for early revision.

The tentative plan aroused a storm of criticism and brought forth many proposals from the carriers themselves. Revisions were incorporated and a "final plan" announced in 1929.[10] Subsequently the subject was reopened at the instance of carriers in eastern territory that wished to have a four-system plan adopted in lieu of the original five-system plan for the East. This principle was accepted by the Commission in a further revision in 1932.[11] The difficulties of determining a plan were such that the Commission repeatedly sought to be relieved of the duty, but this was not accomplished until 1933.

Meanwhile carriers, in the prosperous twenties, were vigorously engaged in jockeying for position. The Baltimore and Ohio proceeded to round out its system and to secure working control of certain properties tentatively assigned to it by the Commission. After obtaining stock control of the Western Maryland it was compelled, however, to trustee the stock. Meanwhile, the Delaware and Hudson had been attempting to build a new trunk-line system, and the Pennsylvania was busily assuring its control of the Wabash and the Lehigh Valley.[12]

Of chief interest and significance was the rise of the Van Sweringen system. Springing from the Nickel Plate, into which the Clover Leaf and Lake Erie & Western were merged, it shortly embraced the far-flung Chesapeake & Ohio, Erie, Pere Marquette, and Missouri Pacific as well as many lesser enterprises. The whole system was loosely held together by the holding-company device and was constructed with comparatively little financial support and in opposition to the plan of the Commission.[13] Having no control over holding companies the latter was powerless to prevent the creation of this curious system. Its history, since the death of the Van Sweringen brothers, has been one of slow disintegration.

New Competition

While the railroads were enjoying a measure of prosperity other events were foreshadowing difficult times ahead. The development of new competitors on the highways and waterways was moving ahead rapidly and the rail carriers were not ready to recognize the potential dangers. Not until the intense depression beginning in 1930 did the full force of the new competition become apparent.

The World War period had seen the opening of the Panama Canal. Its important advantages to ocean trade, arising from the shortening of many heavily traveled ocean routes, are well known. The presence of the canal also facilitated the intercoastal business previously carried on around the Horn or by transfer to land movement. A surplus of seagoing vessels in United States ownership after the close of the war enabled numerous intercoastal operations via the canal to become established at small capital cost. They were able to offer rates considerably under the rail rates and to bid for business over a large hinterland back of the ports. In this fashion a large traffic was diverted from the railroads and new business was built up. The intercoastal route quickly attracted a surplus of tonnage, and the maintenance of stable rates at a level sufficient to sustain the carriers has been difficult. Since the movement is predominantly eastbound, most severe competition has arisen in the attempt to secure westward cargoes.

In the early 1900's the automobile had appeared in the United States, and by 1916 it was serving as a public carrier in the passenger business, threatening the street railway with serious competition. During the late years of the World War the possibility of intercity freight transport by motor truck was demonstrated. Regular services between New York and Philadelphia were begun and private operations were conducted over distances as great as 400 miles.

The multiplication of motor vehicles necessitated the rapid extension of good roads. In the post-war period private automobile ownership and use increased with striking rapidity, producing the greatest growth in passenger transport ever experienced. The appeal of automobile transport has led to the expenditure of as much as $10,000,000,000 in a single year on private passenger transport, five times as much as has ever been spent annually on all other types of passenger transport combined. The growth of automobile ownership created a vast amount of new travel. It also made substantial inroads on steam railroad passenger service, produced the speedy downfall of the interurban electric railway, and seriously affected urban transport.

Truck and bus operations in common, contract, and private carriage were well under way by 1926 and, at the advent of the depression, had begun to make their effects felt. The flexibility of the motor vehicle enabled a speedier, more complete, and personalized service, which became popular with many shippers and travelers. In the passenger business more frequent schedules were possible at lower rates than the railroads were

[9] Ibid., pp. 561–573; 63 I. C. C. 455, 469 (1921).
[10] 159 I. C. C. 522 (1929).
[11] 185 I. C. C. 403 (1932).
[12] Healy, op. cit., 19–20, 303.
[13] Hearings Before Subcommittee of the Committee on Interstate Commerce Pursuant to Senate Resolution 71, 74th Cong., pt. 1, *General Description of Alleghany System*, 1936.

willing to offer. Motor transportation, therefore, grew rapidly.

Increasing highway traffic produced a new set of problems requiring early solution. Since the construction and maintenance of highways were largely at the expense of government units, it was found necessary to introduce regulations of motor vehicle sizes and weights. The problem of financing gave rise to the necessity of devising systems for taxing motor vehicles. Finally, agitation for regulation of motor carriers by the Federal Government culminated in the Motor Carrier Act of 1935.[14]

Aviation owes its commercial success to developments following the stimulus of the World War. The establishment of air-mail services by the Government demonstrated the possibility of reliable day and night service. When, after 1926, encouragement was given to private operators the business began to expand considerably. The last decade has been one of phenomenal advances in equipment, operating methods, and extent of operations. With the stimulus likely to result from the present war, aviation appears to be on the threshold of far-reaching developments.

[14] These developments will be explored at length in later sections of this study.

A Dynamic Industry

The history of the development of transportation emphasizes the effects of important technological advances upon the transport industry and upon the national economy. Improvement in transportation has always been closely associated with advances elsewhere in the industrial structure. Improvements in transport frequently arose from developments in the industrial field, which in turn were greatly stimulated by subsequent application in transport. The multiplicity of recent developments gives assurance of even less stability in the near future than in the past, and emphasizes the serious problem of effecting transitions which may portend the displacement of considerable segments of the transport industry.

The rapid decline in business activity plus the diversion of traffic to competing agencies had, by 1932, cut railroad traffic in half. The resulting "railroad problem", temporarily obscured by the defense effort, is still with us. Subsequent sections will show what efforts have been made to meet the problems existing in the transportation field, what success has been achieved, what things remain undone, and what can be done toward the early improvement of transport conditions.

PART I—SECTION I
2. THE TRANSPORTATION SYSTEM TODAY

By G. Lloyd Wilson and Joseph L. White [1]

Transportation is performed in this country by several types of media, and services are offered by common, contract, and private carriers. Facilities are provided for movement by railway, waterway, highway, airway, and pipe line. Their extent and distribution can best be appreciated by examination of the accompanying maps.

The distribution of traffic by the various modes of transportation for the years 1916 and 1939 is presented in table 1. Figures 3 and 4 illustrate this situation in New England. A comparison of the two years reveals the especially rapid growth of highway and airway transportation during the intervening period.

Railway Transportation

Physical Facilities

The vast network of railway lines covering the United States is shown in figure 1. The mileage of railways reporting to the Interstate Commerce Commission as shown in table 2 consists chiefly of lines operated by steam railroads but also includes data for some interurban electric railways. It does not include mileage for interurban lines not reporting to the Interstate Commerce Commission or for city street railways. This rail network was operated in 1939 by 852 individual steam and electric railway companies reporting to the Interstate Commerce Commission. Of the total number of steam railroads, 167 were classified by the Commission as Class I roads,[2] including 132 line-haul and 35 switching and terminal railroads; 291 were classified as Class II railroads; [3] 293 were Class III; [4] and the remaining 101 were unclassified. Eleven electric railways were Class I roads. Further classification of the operating steam railroads in 1939 is shown in table 3.

Included in this steam and electric system of intercity railways is the Pullman Company, which operates sleeping and parlor cars over all of the large railroads, and the Railway Express Agency, Inc., which operates its express service chiefly in railroad-owned cars over the principal lines. Data relating to the rolling stock of this system on December 31, 1939, are shown in table 4.

TABLE 1.—*Estimated Inland Intercity Traffic by Type of Carrier, 1916 and 1939*

Type of carrier	Freight ton-miles [a]				Passenger-miles [a]			
	1916 (millions)	Percent of total	1939 (millions)	Percent of total	1916 (millions)	Percent of total	1939 (millions)	Percent of total
Railways	367,257	77.2	336,100	62.6	42,045	98.0	23,669	8.6
Steam	366,173	77.0	335,375	62.5	35,220	82.1	22,713	8.3
Electric	1,084	.2	725	.1	[b] 6,825	15.9	956	.3
Inland waterways	[b] 87,833	18.4	96,249	17.9	[b] 864	2.0	[b] 1,486	.5
Great Lakes	[b] 82,377	17.3	76,312	14.2	[b] 377	.9	[b] 798	.3
Rivers and canals	[b] 5,456	1.1	19,937	3.7	[b] 487	1.1	[b] 688	.2
Petroleum trunk pipe lines	[b] 21,000	4.4	[b] 50,995	9.5	------	------	------	------
Crude	[b] 21,000	4.4	[b] 47,123	8.8	------	------	------	------
Refined	None	------	3,872	.7	------	------	------	------
Highways	(c)	------	[b] 53,400	10.0	(c)	------	248,859	90.7
Airways	(c)	------	[d] 11	0.0	(c)	------	678	.2
Total, all carriers	476,090	100.0	536,755	100.0	42,909	100.0	274,692	100.0

[a] Freight ton-miles include estimated ton-miles of private operators on waterway and highways. Passenger-miles include estimated passenger-miles in private automobiles on highways.
[b] Estimated.
[c] Negligible.
[d] Freight ton-miles on airways include mail and express.

Source: Railway figures based on data obtained from the Interstate Commerce Commission. Inland waterways figures based on data from the Chief of Engineers United States Army. Petroleum pipe-line estimates are based on Interstate Commerce Commission data increased to include pipe lines not reporting to the Commission. Highway estimates are based on data from the Interstate Commerce Commission and from the Bureau of Public Roads. Airway data were obtained from the Civil Aeronautics Administration.

TABLE 2.—*Miles of Railway in the United States, Dec. 31, 1939*

Type of railway	First main track	Additional main track	Yard tracks and sidings	Total track
Steam [a]	233,585	35,042	115,920	384,547
Electric [a]	3,951	621	950	5,522
Total	237,536	35,663	116,870	390,069

[a] Excludes street railways.

Source: Interstate Commerce Commission, *Statistics of Railways in the United States*, 1939. To avoid duplication, this table excludes miles operated under trackage rights which are reported by the owning railroad.

TABLE 3.—*Number of Steam Railway Operating Companies and Miles of Track Operated, Dec. 31, 1939*

Type of operating company	Line-haul		Switching and terminal		Total number of companies	Total miles of all track
	Number of companies	Miles of all track	Number of companies	Miles of all track		
All companies	631	409,468	221	7,406	852	416,874
Class I	132	391,435	35	4,519	167	395,954
Class II	187	12,797	104	2,524	291	15,321
Class III	222	4,118	71	312	293	4,430
Not classified	90	1,118	11	51	101	1,169

Source: Interstate Commerce Commission, *Statistics of Railways in the United States*, 1939. These railroads operated 248,040 miles of first main track. If trackage rights are excluded this figure is reduced to 233,585 miles.

[1] Consultants, National Resources Planning Board. The authors have been assisted in the preparation of this section by Doris L. Whitnack.

[2] I. e., railroads having total revenues in excess of $1,000,000 per annum.

[3] Revenues between $1,000,000 and $100,000 per annum.

[4] Revenues under $100,000 per annum.

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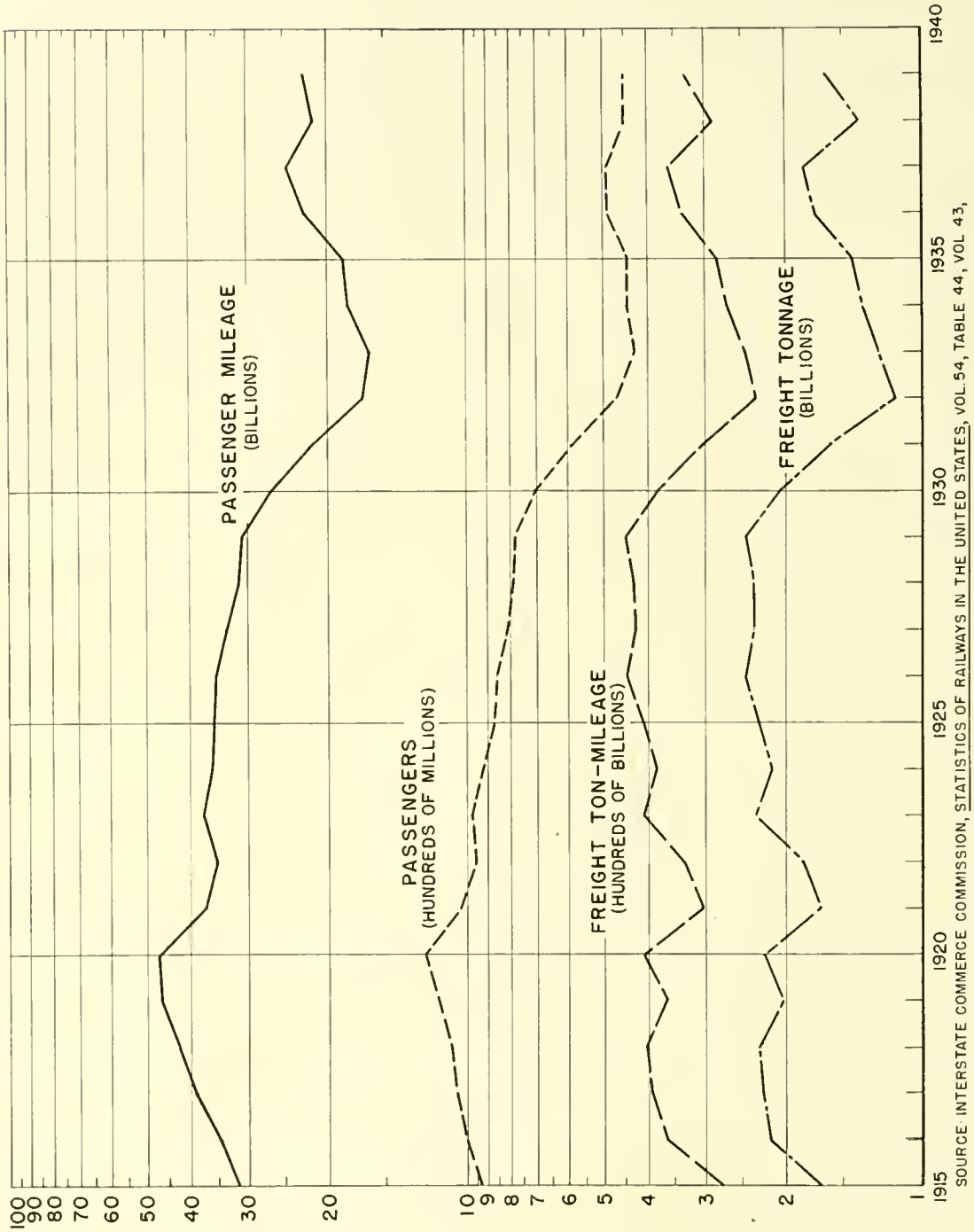
TRENDS IN REVENUE PASSENGERS CARRIED, PASSENGER MILES, FREIGHT TONNAGE, AND FREIGHT TON-MILEAGE FOR CLASS I RAILWAYS, 1915–1939
PASSENGER MILEAGE (BILLIONS)
PASSENGERS (HUNDREDS OF MILLIONS)
FREIGHT TON-MILEAGE (HUNDREDS OF BILLIONS)
FREIGHT TONNAGE (BILLIONS)
100
90
80
70
60
50
40
30
20
10
9
8
7
6
5
4
3
2
1
1915
1920
1925
1930
1935
1940
SOURCE: INTERSTATE COMMERCE COMMISSION, STATISTICS OF RAILWAYS IN THE UNITED STATES, VOL. 54, TABLE 44, VOL. 43, STATEMENT 25, VOL. 35, STATEMENT 25.

FIGURE 2

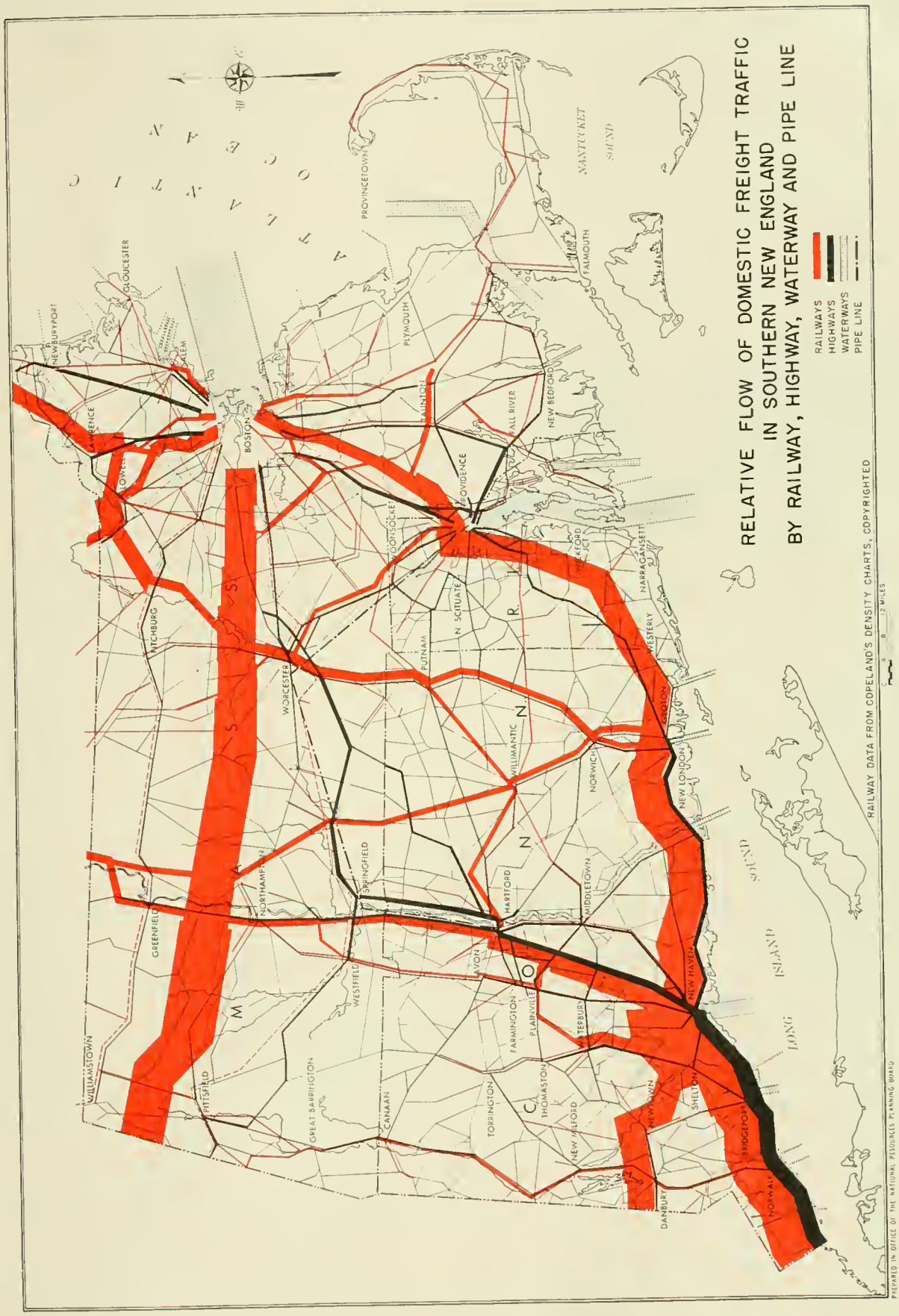
RELATIVE FLOW OF DOMESTIC FREIGHT TRAFFIC
IN SOUTHERN NEW ENGLAND
BY RAILWAY, HIGHWAY, WATERWAY AND PIPE LINE
RAILWAYS
HIGHWAYS
WATERWAYS
PIPE LINE
RAILWAY DATA FROM COPELAND'S DENSITY CHARTS, COPYRIGHTED
PREPARED IN OFFICE OF THE NATIONAL RESOURCES PLANNING BOARD
ATLANTIC OCEAN
NANTUCKET SOUND
LONG ISLAND SOUND
PROVINCETOWN
FALMOUTH
PLYMOUTH
NEW BEDFORD
FALL RIVER
BOSTON
PROVIDENCE
WOONSOCKET
N SCITUATE
PUTNAM
WORCESTER
WILLIMANTIC
NORWICH
NEW LONDON
GROTON
WESTERLY
NARRAGANSETT
WICKFORD JCT
NEW HAVEN
SHELTON
BRIDGEPORT
NORWALK
DANBURY
NEWTOWN
NEW MILFORD
THOMASTON
TORRINGTON
CANAAN
GREAT BARRINGTON
PITTSFIELD
WILLIAMSTOWN
WESTFIELD
SPRINGFIELD
NORTHAMPTON
GREENFIELD
HARTFORD
MIDDLETOWN
FARMINGTON
PLAINVILLE
WATERBURY
LAVON
LOWELL
LAWRENCE
NEWBURYPORT
GLOUCESTER
SALEM
ATCHBURG
M A S S
C O N N R I
N

FIGURE 3

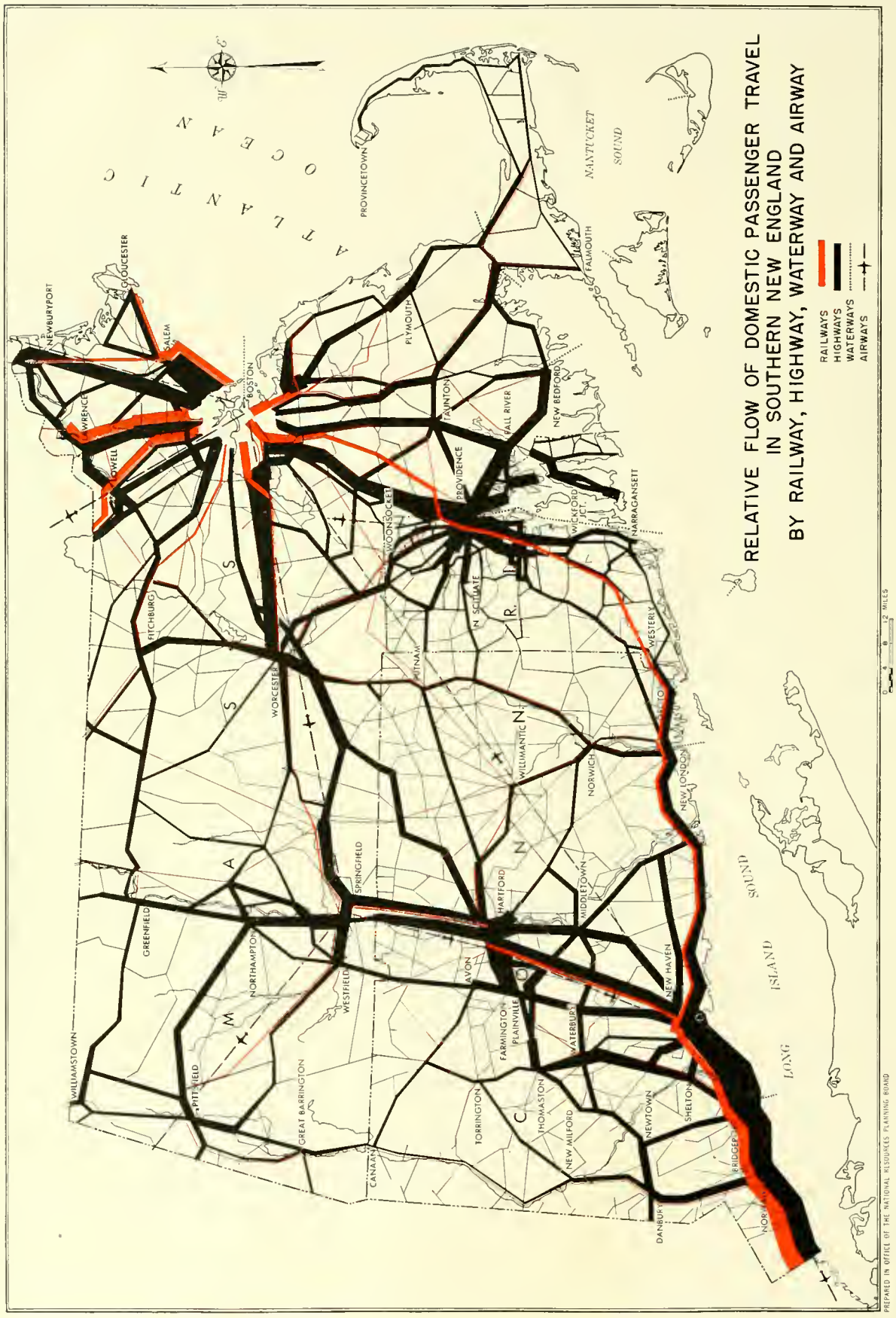
RELATIVE FLOW OF DOMESTIC PASSENGER TRAVEL
IN SOUTHERN NEW ENGLAND
BY RAILWAY, HIGHWAY, WATERWAY AND AIRWAY
RAILWAYS
HIGHWAYS
WATERWAYS
AIRWAYS
0 4 8 12 MILES
ATLANTIC OCEAN
NANTUCKET SOUND
LONG ISLAND SOUND
PROVINCETOWN
FALMOUTH
NEW BEDFORD
FALL RIVER
TAUNTON
PLYMOUTH
PROVIDENCE
WOONSOCKET
NARRAGANSETT
WICKFORD JCT.
WESTERLY
NEW LONDON
NORWICH
WILLIMANTIC
N. SCITUATE
PUTNAM
MIDDLETOWN
HARTFORD
NEW HAVEN
WATERBURY
FARMINGTON
PLAINVILLE
AVON
SPRINGFIELD
WESTFIELD
WORCESTER
BOSTON
SALEM
GLOUCESTER
NEWBURYPORT
LOWELL
LAWRENCE
FITCHBURG
GREENFIELD
NORTHAMPTON
PITTSFIELD
WILLIAMSTOWN
GREAT BARRINGTON
CANAAN
TORRINGTON
THOMASTON
NEW MILFORD
NEWTOWN
SHELTON
BRIDGEPORT
DANBURY
NORWALK
PREPARED IN OFFICE OF THE NATIONAL RESOURCES PLANNING BOARD

FIGURE 4

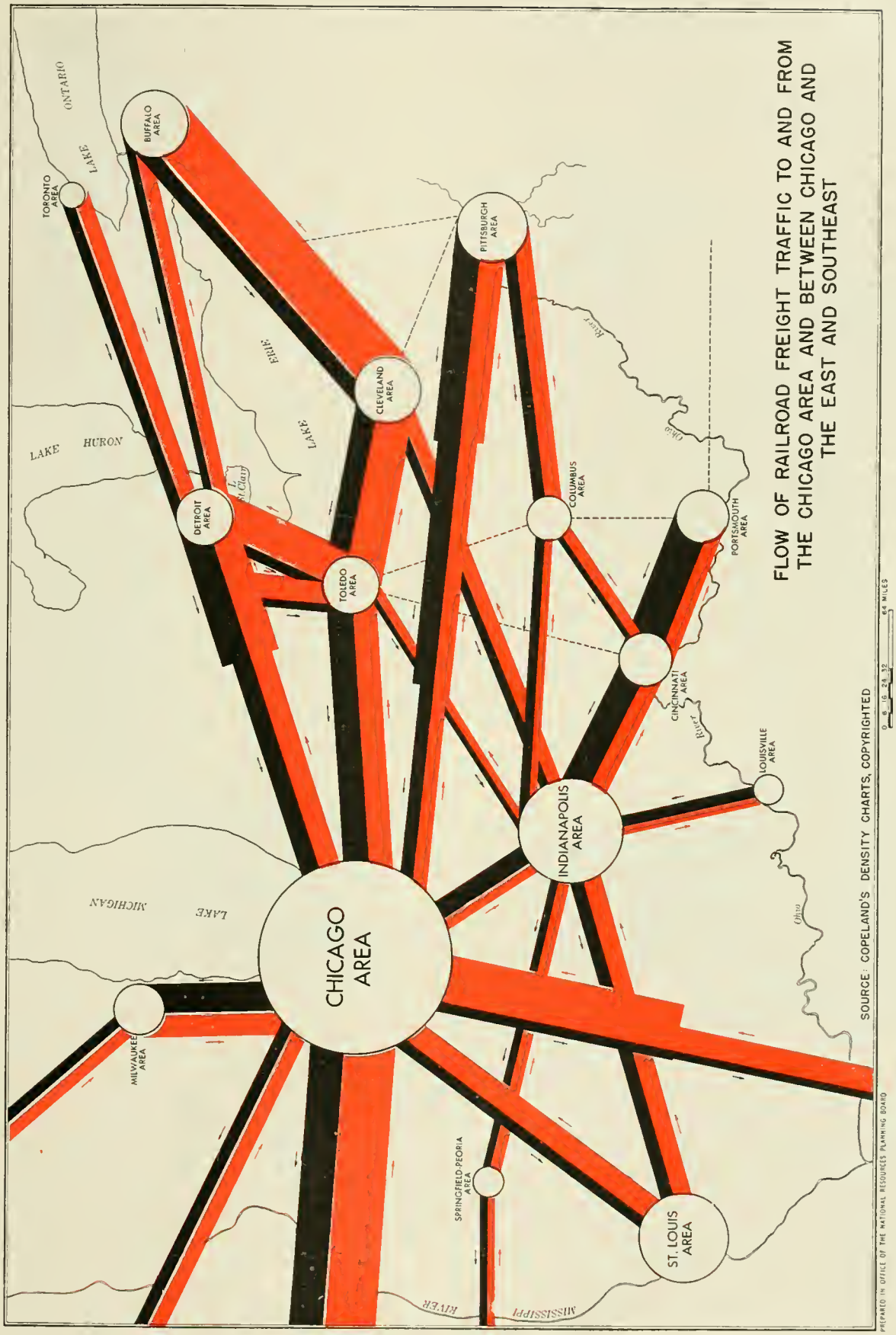
FLOW OF RAILROAD FREIGHT TRAFFIC TO AND FROM THE CHICAGO AREA AND BETWEEN CHICAGO AND THE EAST AND SOUTHEAST
CHICAGO AREA
INDIANAPOLIS AREA
ST. LOUIS AREA
SPRINGFIELD-PEORIA AREA
MILWAUKEE AREA
LOUISVILLE AREA
CINCINNATI AREA
PORTSMOUTH AREA
COLUMBUS AREA
PITTSBURGH AREA
CLEVELAND AREA
TOLEDO AREA
DETROIT AREA
BUFFALO AREA
TORONTO AREA
LAKE ONTARIO
LAKE ERIE
LAKE HURON
LAKE MICHIGAN
MISSISSIPPI RIVER
Ohio River
SOURCE: COPELAND'S DENSITY CHARTS, COPYRIGHTED
PREPARED IN OFFICE OF THE NATIONAL RESOURCES PLANNING BOARD

FIGURE 5

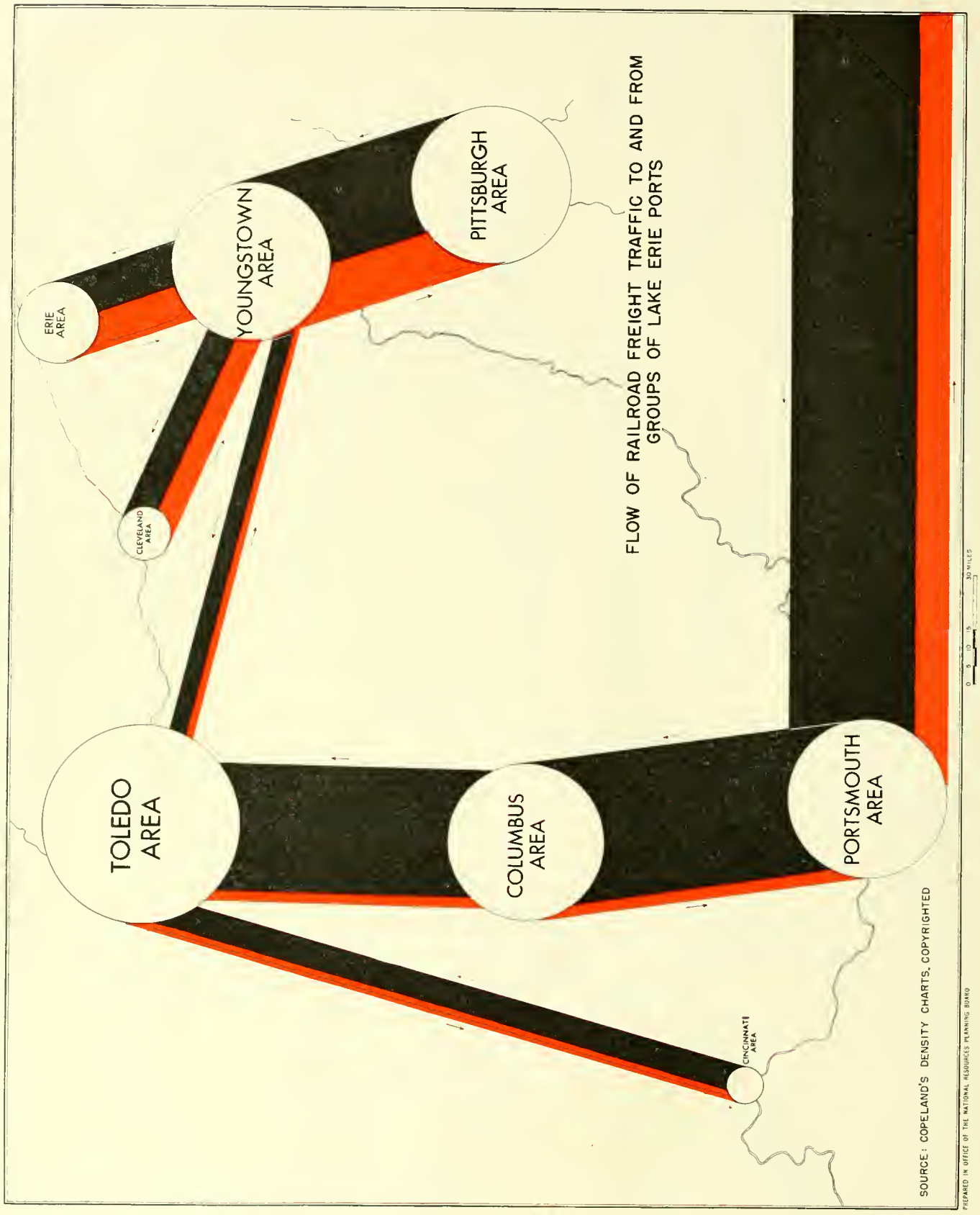
FLOW OF RAILROAD FREIGHT TRAFFIC TO AND FROM GROUPS OF LAKE ERIE PORTS
ERIE AREA
YOUNGSTOWN AREA
PITTSBURGH AREA
CLEVELAND AREA
TOLEDO AREA
COLUMBUS AREA
PORTSMOUTH AREA
CINCINNATI AREA
0 5 10 15 30 MILES
SOURCE: COPELAND'S DENSITY CHARTS, COPYRIGHTED
PREPARED IN OFFICE OF THE NATIONAL RESOURCES PLANNING BOARD

FIGURE 6

TABLE 4.—*Rolling Stock on the Railways, Dec. 31, 1939*

Type of equipment	1939
Number of locomotives, steam railways [a]	45,172
Freight-train cars:	
Steam railways	1,702,968
Private car lines	281,186
Express companies	237
Passenger-train cars:	
Steam railways	38,977
Pullman Company	7,052
Company service cars, steam railways	77,077

[a] Average tractive power of steam locomotives on line-haul railways was 50,395 pounds.

Source: Interstate Commerce Commission, *Statistics of Railways in the United States*, 1939.

As of 1937 the value for rate-making purposes of this system, excluding the Pullman Company, was approximately 21 billion dollars.[5] In addition the properties of the Pullman Company were allowed a valuation of 150 million dollars in *Increased Pullman Fares and Charges, 1937*.[6]

Railway Traffic

The trends of railroad freight and passenger traffic during the period 1915 to 1939 are shown in figure 2. This chart is constructed on a logarithmic scale and emphasizes rates of change, rather than absolute changes. It will be observed that the rapid growth of freight traffic ceased during the twenties and that, as a result of the growth of private automobile use and a backward rate policy, an early decline in passenger transport set in which was not reversed until 1934. The loss of short-haul business is indicated by the slightly slower decline of ton-miles than of tonnage.

Freight service has been substantially improved in an effort to meet motor-carrier competition and to satisfy the needs of users for inventory curtailment by reliance upon transportation agencies for quick replacement. Schedules have been speeded up between all important points, universal pick-up and delivery services for less-than-carload freight are now available, and special container and similar coordinated arrangements are numerous. Refrigeration service has been improved and new equipment has been devised to reduce loss and damage in transit. Meanwhile rate adjustments have aided in placing railroad service on a more favorable basis in competition. Gradual modernization of plant and rolling stock have resulted in operating economies as well as service improvement.

Passenger service, too, has been considerably improved during the past 10 years, both with respect to equipment and to the speed of many trains. The most notable improvements in equipment have been air-conditioning of most through trains and the construction of new, attractive, and comfortable day coaches. In addition, many Diesel-powered, streamlined trains, operating at high speeds, have been introduced. These improvements, accompanied by substantial rate reductions, have helped bring about a reversal in the declining trend in passenger traffic.

Traffic Density

In order to portray the flow of traffic by the different types of transport facilities, several charts have been prepared showing the relative flow of traffic on these facilities. In these charts the width of the line over the different routes indicates the relative density of traffic expressed in the number of tons per day for freight traffic and passengers per day for passenger traffic.

Figure 3 shows the proportions of freight traffic in southern New England moving by railway, highway, waterway, and pipe line. Figure 4 serves a similar purpose for passenger traffic. For the purpose of this chart the freight traffic on the Boston and Albany and the Boston and Maine between the New York State

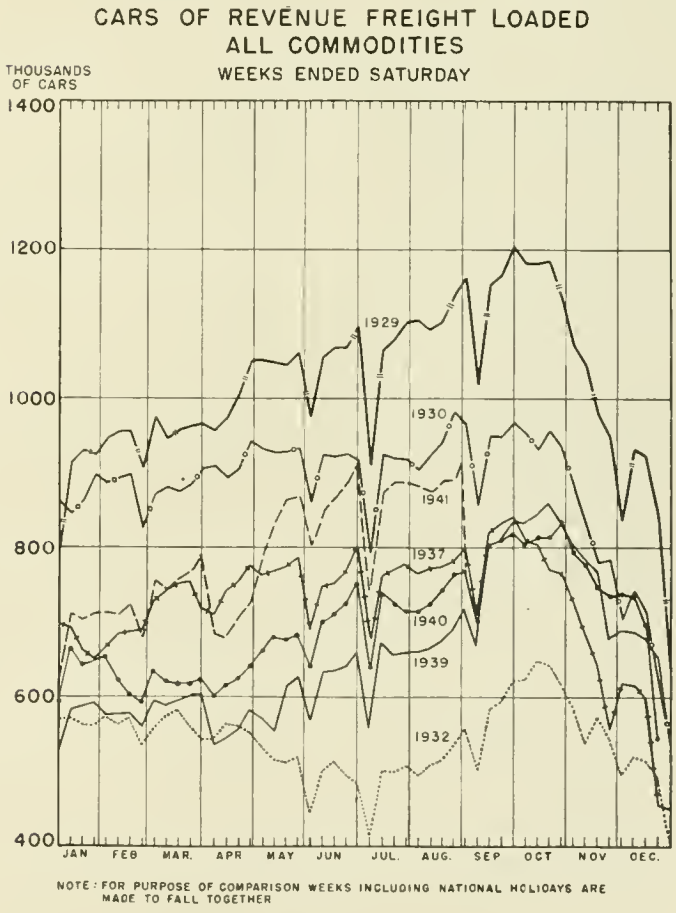

FIGURE 7

[5] See *Ex parte 123*, 226 I. C. C. 62 (1938).
[6] *Ex parte 125*, 227 I. C. C. 644 (1938).

Line and Boston marked by a dotted line on figure 3 has been combined in one line. The waterway freight traffic shown on figure 3 represents chiefly domestic coastal or intercoastal traffic received and shipped at New England ports and passing through the Cape Cod Canal. The greater part of this traffic was in-bound coal and petroleum products.

These charts demonstrate clearly that the railroads still constitute the backbone of the country's inland transportation system for freight, but that there has been a tremendous change in the travel habits of the American people which has shifted the bulk of passenger transportation from the railways to the highways. Railroad commutation travel still is heavy to and from such large centers as New York and Boston, although even a large part of this travel has been lost to the private automobile. Railroad through travel between large cities is also still heavy. Travel by airway, measured by its density, appears relatively unimportant but compared with travel in railroad sleeping and parlor cars is of growing significance.

Figure 5 shows the flow of railroad freight traffic in the Great Lakes region, one of the principal centers of industrial activity in the United States. The source of these statistics was the copyrighted Copeland's Density Charts and, in order not to disclose the identity of individual railroads, the flow of traffic was shown by groups of two or more railroads through the principal traffic areas or gateways in the territory. The chart shows the flow of traffic in and out of Chicago and between Chicago and St. Louis and the eastern gateways of Buffalo and Pittsburgh and in addition the flow of traffic over the Canadian lines through Toronto. Figure 6 shows the flow of railroad traffic between the Ohio River and the Lakes ports, which was too heavy to show on figure 5. The ports and the railroads serving them have also been grouped on this chart to avoid disclosing the tonnage of individual companies.

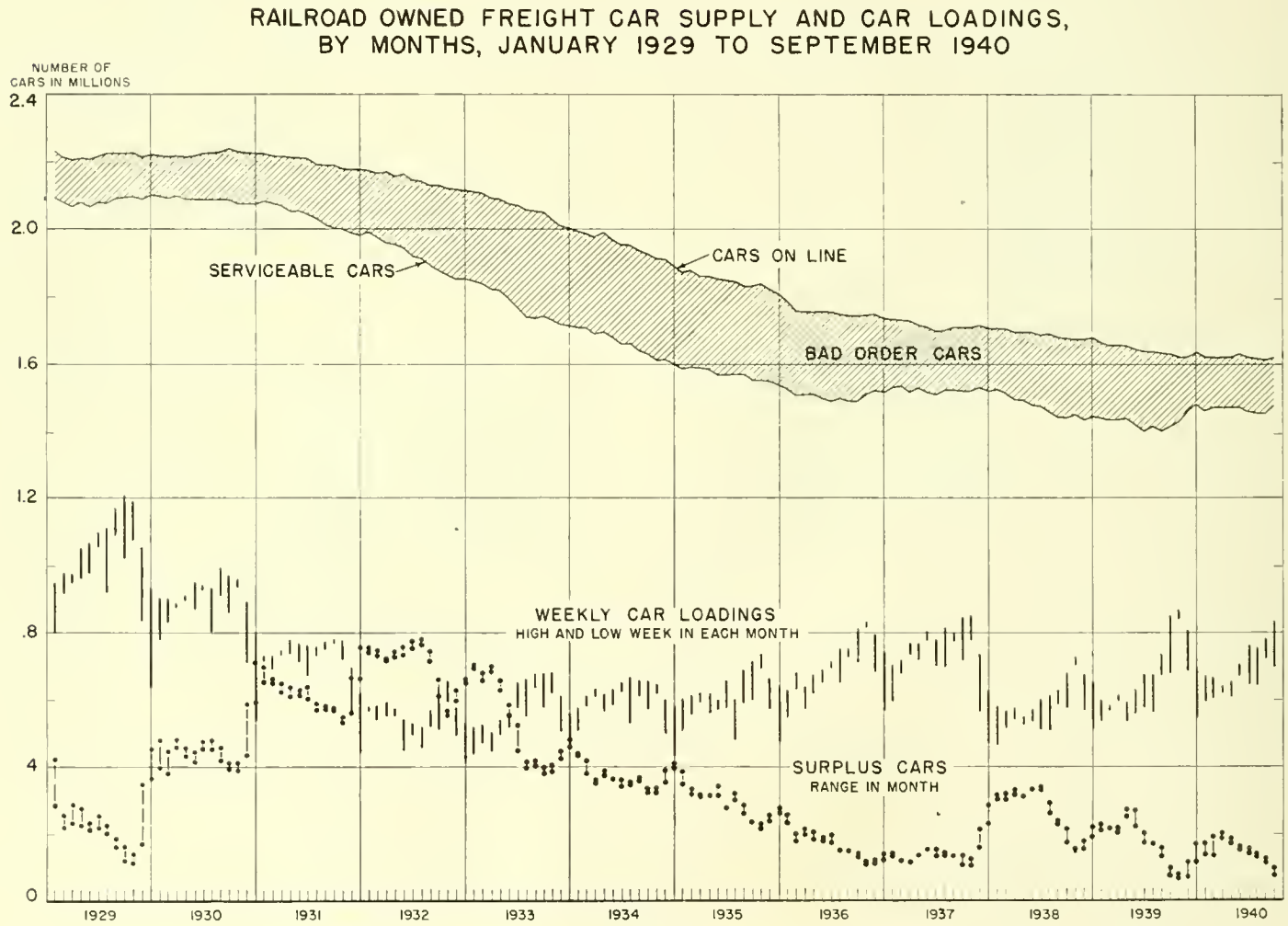

Figure 8

Present Utilization of the Railway System

In analyzing the capacity of the railways for freight service under present operating conditions, it is necessary to distinguish between line-haul and terminal operations. By line haul is meant the movement between the terminal at which the car is loaded or received from connections and the terminal at which it is unloaded or delivered to connections. The capacity of an individual railroad for handling traffic usually is not limited by line-haul operating conditions but by its terminal facilities and operating practices. When two or more railroads handle a shipment, considerable time is lost in interchange and the total terminal delay usually is greater than when the shipment is handled by one railroad from origin to destination. Delays and congestion, except temporary delays due to accidents, occur chiefly at terminals. These terminal delays and congestion not only absorb the car supply but cause reports of shortage and of apparent inability of the railroads to handle the traffic. It should be noted that there has been no general car shortage since 1923, though scattered local shortages have appeared in times of pressure.

TABLE 5.—*Average Distribution of Time of Typical Movement of Loaded Freight Car Between Railroads and Shippers, 1933*

	Hours	Percent of total
Total railroads	76	53
Line haul (train movement)	23	16
Terminals, including intermediate yards	53	37
Shippers	68	47
Total terminals (railroads and shippers)	121	84
Total movement	144	100

Source: Federal Coordinator of Transportation, *Freight Traffic Report*, appendix IV, p. II 1936.

The relative importance of terminal delays in the movement of freight by rail was shown in a study prepared by the Federal Coordinator of Transportation. The average distribution of the time of a loaded freight car from placement for loading until release by the consignee is shown in table 5. For an average haul of 376 miles the train speed averaged 16 miles per hour. Only 16 percent of the time was spent in line haul; the remaining 84 percent was spent in the terminals, including intermediate yards. A large part of the delay at terminals was caused by the tendency of many shippers to use cars for temporary storage. Even if unnecessary delay on the part of shippers in loading and unloading cars could be eliminated, the time consumed by the railroads in switching cars between the train yards and the shippers' plants and in making up trains in the yards is often excessive.

Allowance should be made for terminal delays growing out of present operating practices. In an emergency these delays could be reduced or eliminated by joint action of the railroads themselves with a resultant increase in the capacity. With this terminal situation in mind, the record of cars handled by the railroads may be examined in order to determine what part of total capacity of the railroad plant is used under present operating methods.

The best statistics for this purpose are the reports of cars of revenue freight loaded weekly, issued by the Association of American Railroads. Carloadings for the years 1929, 1930, 1932, 1937, 1939, 1940, and 1941 are plotted on figure 7 and the relation between these car loadings and the freight car supply for selected years between 1929 and 1940 is shown by figure 8. Weekly carloadings are not uniform throughout the year; heaviest loadings occur in August, September, and October and these peaks are well above secondary peaks in the balance of the year.[7] The highest week during the 6 years was that ending September 30, 1929, when 1,203,139 cars were loaded. The only week during which this record has been exceeded was that ending October 28, 1926, when 1,208,876 cars were loaded. The peak week for each of the 6 years is given in table 6.

TABLE 6.—*Peak Week of Railroad Car Loadings for Selected Years, 1929 to 1940*

Year	Week ending—	Revenue cars loaded	Percent of 1929
1929	Sept. 30	1,203,139	100
1930	Sept. 2	984,510	82
1932	Oct. 14	649,690	54
1937	Sept. 30	843,861	70
1939	Oct. 21	856,289	71
1940	Oct. 26	837,651	70
1941	Oct. 18	922,884	77

Source: Association of American Railroads, Car Service Division, Weekly Reports on Carloadings.

The peak week of carloading since the bottom of the depression in 1932 was that ending October 18, 1941, when 922,884 cars were loaded. This loading, however, was only 77 percent of the loading in the peak week of 1929. If the question of adequate locomotive and car equipment is temporarily ignored the foregoing comparison of the number of cars loaded in the peak week of 1929 and the peak weeks of 1937, 1939, and 1940 indicates considerable surplus capacity so far as the permanent tracks and structures are concerned.

With respect to rolling stock, a comparison of the number and capacity of locomotives and cars on Class I railroads on December 31, 1929 and 1939, and the traffic requirements for those years is given in tables 7 and 8. Data in table 7 indicate that the number of locomotives and freight cars decreased from 1929 to 1939 by about

[7] One of the railroads' problems is to put their locomotives and cars in shape during the lighter traffic months to handle these peaks.

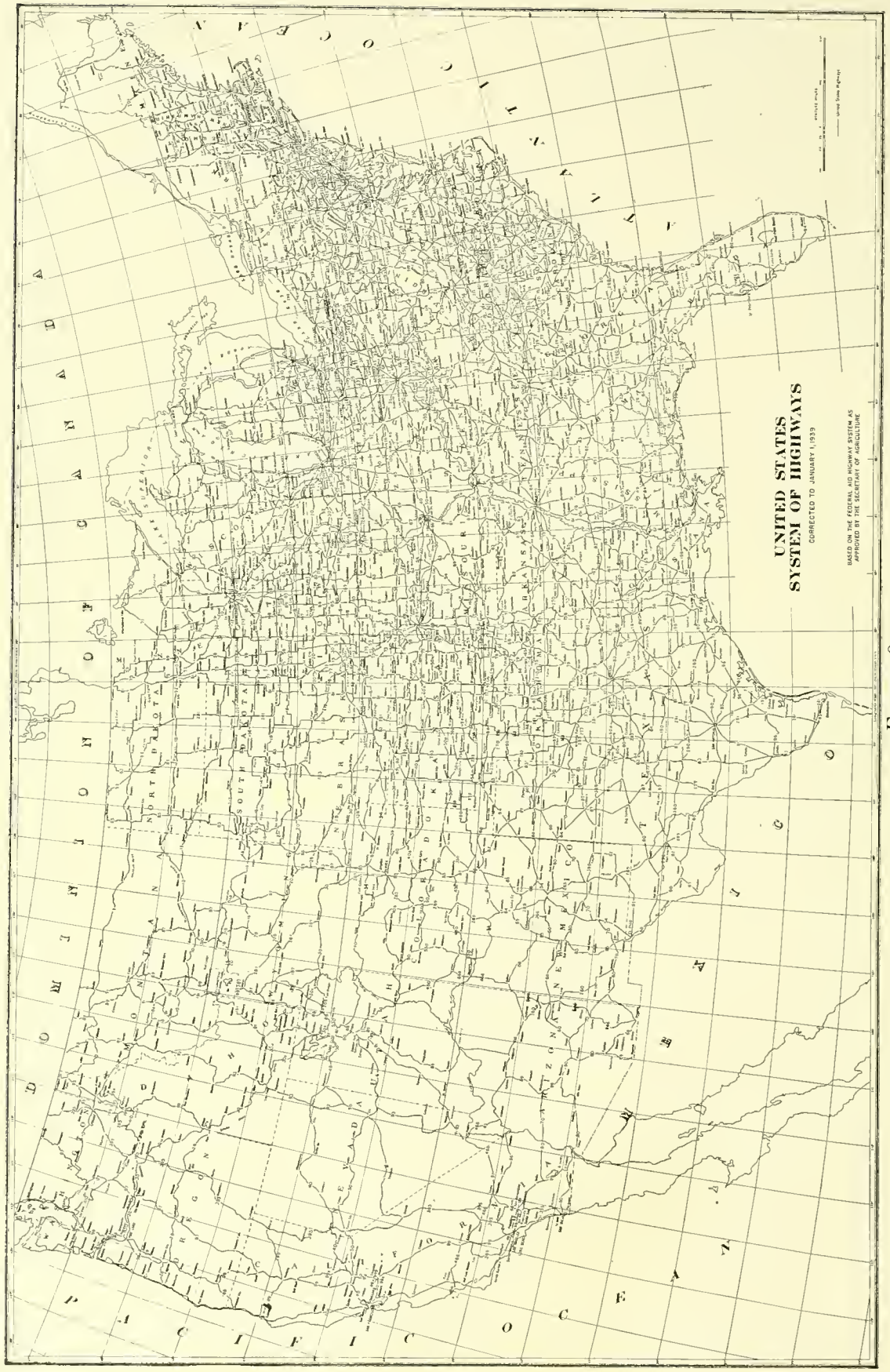
UNITED STATES
SYSTEM OF HIGHWAYS
CORRECTED TO JANUARY 1, 1939
BASED ON THE FEDERAL AID HIGHWAY SYSTEM AS
APPROVED BY THE SECRETARY OF AGRICULTURE
DOMINION OF CANADA
ATLANTIC OCEAN
PACIFIC OCEAN
MEXICO

FIGURE 9

the same percent as the traffic shown in table 8. On the other hand, there has been a substantial increase in the average tractive effort of locomotives and average capacity of cars through retirement of the older and lighter units. Furthermore, the average haul per ton originated on the railways taken as a system has increased 10.8 percent. Although the capacity of the railroad plant is now below that in 1929 on account of a reduction in rolling stock, it is somewhat above the peak requirements of 1939 and 1940. Additional cars were purchased for 1941 delivery and a substantial reduction has been made in the number of bad order cars.

TABLE 7.—*Numbers and Capacity of Rolling Stock on Class 1 Railways December 31, 1929 and 1939*

	Dec. 31, 1939	Dec. 31, 1929	Increase or decrease	
			Amount	Percent
All locomotives.....number..	42, 511	57, 511	−15, 000	−26. 1
Steam.....do....	41, 117	56, 936	−15, 819	−27. 8
Aggregate tractive power, thousands of pounds..... ..	2, 072, 110	2, 550, 813	−478, 703	−18. 8
Average tractive power, pounds.....	50, 395	44, 801	+5, 594	+12. 5
Other.....number..	1, 394	635	+759	+119. 5
Freight train cars.....do....	1, 671, 712	2, 306, 804	−635, 092	−27. 5
Aggregate capacity.....tons..	82, 001, 557	105, 410, 586	−23, 409, 029	−22. 2
Average capacity.....do....	49. 7	46. 3	+3. 4	+7. 3
Passenger train cars.....number..	45, 479	61, 728	−16, 249	−26. 3
Railroad owned.....do....	38, 427	52, 259	−13, 832	−26. 5
Pullman.....do....	7, 052	9, 469	−2, 417	−25. 5

Source: Compiled from Interstate Commerce Commission, *Statistics of Railways in the United States*, 1939.

The passenger traffic of the railways has declined so seriously since 1929 that there has been little difficulty in handling all traffic offered. Although the downward trend of traffic has been reversed by business recovery and improved service, there is no indication that the railroads are approaching their capacity for handling of passenger traffic except over holiday week ends. On the other hand, substantial increases in troop movements to and from cantonments and in military maneuvers may cause a severe shortage of passenger equipment. Passenger-miles in 1918 were 23 percent over 1916, while in 1919 they were 34 percent over 1916, largely as a result of troop movements.

Highway Transportation

Highway Facilities

The Nation's highway facilities comprise a network of about 3,270,000 miles of surfaced and unsurfaced roads, streets, and alleys. This total is made up of 2,990,000 miles of intercity highways (including 25,000 miles of transcity connections of intercity highways) and approximately 279,000 miles of local streets and alleys. In table 10 highways are classified by control agencies and types of surface as of the end of 1940.

The backbone of intercity highway transportation is the Federal-aid highway system. In May 1941 it comprised 231,510 miles. Figure 9 shows the Federal-aid highway system as of January 1, 1939. It is estimated that 56 percent of the rural vehicle-miles are made on the Federal-aid system.[8]

TABLE 8.—*Traffic on Class I Railways, December 31, 1929 and 1939*

	Dec. 31, 1939	Dec. 31, 1929	Increase or decrease	
			Amount	Percent
Freight traffic:				
Revenue tons originated thousands..	901, 669	1, 339, 091	−437, 422	−32. 7
Revenue tons carried....do....	1, 636, 215	2, 451, 601	−815, 386	−33. 3
Revenue ton-miles.....do....	333, 438, 412	447, 321, 561	−113, 883, 149	−25. 5
Average haul per ton originated miles..	370	334	+36	+10. 8
Average haul per ton carried do..	204	182	+22	+12. 1
Carloadings.....weekly peak..	861, 198	1, 203, 139	−341, 941	−28. 4
Passenger traffic:				
Passengers carried thousands [a]..	450, 372	780, 468	−330, 096	−42. 3
Commutation.....do....	231, 126	457, 617	−226, 491	−49. 5
Other.....do....	219, 913	321, 449	−101. 536	−31. 6
Passenger-miles .....millions [a]..	22, 651	31, 074	−8, 423	−27. 1
Commutation.....do....	4, 012	6, 898	−2, 886	−41. 8
Other.....do....	18, 645	24, 180	−5, 535	−22. 9
Average journey per passenger per railroad.....miles..	50. 3	39. 8	+105	+26. 4
Commutation.....do....	17. 4	15. 1	+23	+15. 2
Other.....do....	84. 8	75. 2	+96	+12. 8

[a] The total does not exactly equal the sum of "commutation" and "other" as the latter items are taken from monthly reports which include some system returns.

Source: Compiled from Interstate Commerce Commission, *Statistics of Railways in the United States*, 1939, and Association of American Railroads, *Statistics of Railways of Class I, United States* (1926–1939).

The progress in surfacing rural roads in the United States from 1921 to 1940 is shown in table 9. Whereas only 13 percent of all rural roads were surfaced in 1921, 45 percent were surfaced in 1940.

The estimated depreciated investment in highway facilities and vehicles as of January 1, 1940, is shown in table 11.

TABLE 9.—*Progress in Surfacing of Rural Road Mileage in the United States, Selected Years, 1921 to 1940*

THOUSANDS OF MILES

	[a] 1921	[a] 1931	[b] 1940
Total rural-road mileage.....	2, 925	3, 036	2, 965
Roads under State control.....	203	374	539
Primary and secondary State highways.....	203	329	423
County roads under State control.....	...	45	116
County and local roads [c]	2, 722	2, 662	2, 426
Surfaced rural road mileage	387	830	1, 328
Roads under State control.....	84	258	425
Primary and secondary State highways.....	84	243	370
County roads under State control.....	...	15	55
County and local roads	303	572	903

PERCENTAGES

Percentage of rural road mileage surfaced	13	27	45
Roads under State control	41	69	79
Primary and secondary State highways.....	41	74	87
County roads under State control	...	33	47
County and local roads.....	11	21	37

[a] In these years special surveys of county and local road mileage were made covering all counties.
[b] Estimates based on planning survey reports and other statistical data. See table 10.
[c] Reduction of county and local road mileage shown for 1937 reflects influence of planning survey road inventories in eliminating roads not actually in use.

Source: Federal Works Agency, Public Roads Administration.

[8] Hearings before the Committee on Roads, on H. R. 7891, 1940, p. 194.

TABLE 10.—*Estimated Mileage of Roads, Streets, and Alleys by Class of Control and by General Surface Types, 1940*

Class of control	Total, all types		Unsurfaced						Surfaced							
			Total		Unimproved		Graded and drained		Total		Nondustless surface-treated and mixed bituminous [a]		Dustless gravel, stone, and stabilized soil [b]		Paved [c]	
	Thousands of miles	Per cent all classes of control	Thousands of miles	Per cent all types of surface	Thousands of miles	Per cent all types of surface	Thousands of miles	Per cent all types of surface	Thousands of miles	Per cent all types of surface	Thousands of miles	Per cent all types of surface	Thousands of miles	Per cent all types of surface	Thousands of miles	Per cent all types of surface
Rural roads: [d]																
Roads under State control: [e]																
Primary State highways	335	10.3	29	8	15	4	14	4	306	92	126	38	54	16	126	38
Secondary State highways	88	2.7	24	27	7	8	17	19	64	73	21	24	33	38	10	11
County roads under State control	116	3.5	61	52	26	22	35	30	55	48	7	6	46	40	2	2
Total	539	16.5	114	21	48	9	66	12	425	79	154	28	133	25	138	26
County and local roads [f]	2,426	74.2	1,523	63	936	39	587	24	903	37	102	4	748	31	53	2
Total rural roads [f]	2,965	90.7	1,637	55	984	33	653	22	1,328	45	256	9	881	30	191	6
City and village streets and alleys: [g]																
Transcity connections of State highways	25	.8	[h]	-------	-------	-------	-------	-------	25	100	5	20	1	4	19	76
Local streets and alleys	279	8.5	76	27	-------	-------	-------	-------	203	73	44	16	84	30	75	27
Total streets and alleys	304	9.3	76	25	-------	-------	-------	-------	228	75	49	16	85	28	94	31
Total roads, streets, and alleys	3,269	100.0	1,713	52	-------	-------	-------	-------	1,556	48	305	9	966	30	285	9

[a] Includes dustless surfaces of low and intermediate bituminous types.
[b] Includes all nondustless surfaces.
[c] Includes bituminous penetration, bituminous concrete, sheet asphalt, portland cement concrete, brick and block pavements.
[d] The estimated totals include national park and forest roads and trails and roads in Federal reservations. Where not a part of the State highway systems, such roads are classed as local.
[e] 1940 mileages estimated by applying to reported data for end of 1938 mileage changes (construction, retirement, and transfer) equal to those which occurred during the biennium 1937–38. See Public Roads, tables SM–1 to SM–4 and SMB–1 to SMB–4, 1938, for detail by States.
[f] Estimates based on planning survey road inventories giving road mileages for period 1936–37 as follows: Total rural-road mileage, 2,960,000; surfaced mileage, 1,170,000–1,200,000. Present status of county and local roads approximated by applying to 1936–37 data estimates of construction, retirements, and transfer based on recent (1937–39) county and local road mileage reports received from 9 States having a total of 425,000 miles of county and local roads. See *Public Roads*, vol. 21, No. 8, Oct. 1940, "State of Improvement of Rural Roads in Relation to Travel and Dwelling Service, as Revealed by Results of the Planning Surveys."
[g] In the planning survey fiscal studies, estimates of the mileage, by types, of city and village streets and alleys were obtained from local officials. Classified totals for 20 States were expanded for the country as a whole on the basis of distribution by types in each urban population group (1,000 or less, 1,000–2,500, 2,501–5,000, etc.) and adjusted roughly to account for increases in surfaced mileage during the period 1936–40. With the exception of data on transcity connections of State highways, municipal street mileages are highly approximate. There was no segregation of unsurfaced mileage between unimproved and graded and drained.
[h] Less than 500 miles.

Source: Federal Works Agency, Public Roads Administration.

TABLE 11.—*Estimated Depreciated Investment in Highway Facilities and Vehicles, January 1, 1940*

Types of facility or vehicle	Estimated depreciated investment (millions)
Roads and streets	$20,000
Vehicles	11,764
Passenger automobiles	6,500
Busses	850
Taxicabs	14
Private motortrucks	3,800
For hire motortrucks	600
Total highway facilities and vehicles	31,764

Motor Vehicle Registrations.—The registrations of passenger automobiles and motortrucks at the beginning of census years (and 1916) from 1900 to 1940 is shown in table 12. The remarkable increase in the ownership of passenger automobiles in the United States is forcefully indicated by the comparison of the number of passenger automobiles per 1,000 persons. The relationship between the increase in registration of passenger automobiles and the increase in miles of surfaced highways since 1921 is shown by figure 10. The chart indicates that up to 1930 the increase in passenger automobile registrations proceeded at a faster rate than the increase in surfaced roads. Beginning with 1931, however, the situation was reversed. Registrations fell off and did not again pass the 1931 figure until 1935. The public works programs during the depression years resulted in an extensive program of highway improvements which is still under way.

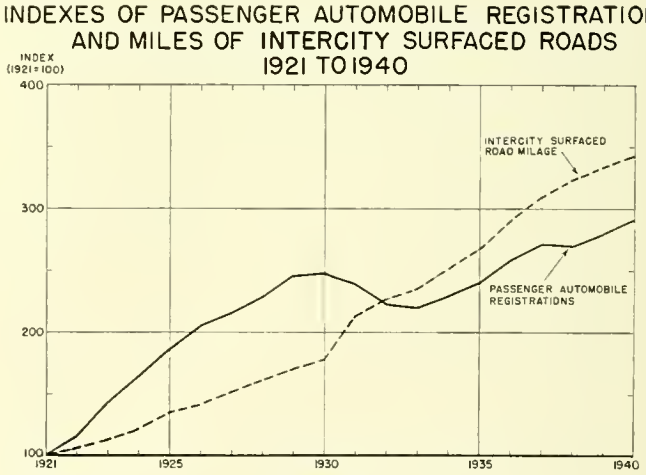

FIGURE 10

TABLE 12.—*Motor Vehicle Registrations and Passenger Automobiles per 1,000 Persons, Selected Years 1900 to 1940*

Year as of Jan. 1	Motortrucks	Passenger automobiles	Passenger automobiles per 1,000 persons
1900		3,200	0.1
1910	6,050	305,950	5.0
1916	136,000	2,309,666	32.7
1920	794,372	6,771,074	77.2
1930	3,379,854	23,121,589	187.4
1940	4,413,692	26,201,395	207.3

Source: Based on data from the Automobile Manufacturers' Association.

Transportation of Passengers by Highway

The private automobile has revolutionized the travel habits of the American people. Long-distance transportation of passengers by private automobile was almost negligible prior to the first World War when the railroads handled most of the business. Facilities of electric railways and waterways were of minor consequence in this period.

In addition to its wide use in long-distance intercity transportation, the private automobile in many communities has become the sole means of local transportation. A survey of intraurban transport conducted by the Automobile Manufacturers Association showed that, in 1940, 2,130 urban centers with populations of more than 2,500, totaling 11,844,124 persons, had no means of local transportation except private automobiles. Of these communities, 168 were of substantial size, having populations between 10,000 and 50,000. Results of the survey are shown in table 13. Many cities, of course, have streetcar, trolleybus, and motorbus transportation in addition to private automobile service. In the larger communities, with populations of 500,000 and upward, as many as 70 percent of the persons entering the business sections of the city during the typical business day travel in private automobiles.[9] Business travel accounts for about 55 percent of the total passenger vehicle mileage. In rural sections, 64 percent of the travel is for business, and 36 percent for recreational purposes; in urban communities the proportions are 51 percent and 49 percent, respectively.

Motorbus Transportation

Classification of motorbusses is difficult to make because they are often used interchangeably in different services. Estimates for 1940 indicate that the number of busses engaged in various services for that year were city, 22,000; city-suburban, 11,550; intercity, 18,000; and sightseeing or charter-hire, 2,450. In 1940 there were 2,308 companies engaged in intercity services, 750 in city and city-suburban services, and 420 in sightseeing or charter-hire. Busses otherwise used in 1940 include 87,300 employed in school-bus services, and approximately 1,000 additional units in hotel, industrial, and miscellaneous private-carrier operations.

[9] Automobile Manufacturers Association, *Automobile Facts*, vol. III No. 7, pp. 1–3, March 1941.

TABLE 13.—*Local Transportation Facilities of 3,442 Urban Communities in the United States, 1940*

Size of city	Total cities in U. S.		Number of cities having mass transportation service [b]					Cities having no local mass transportation	
	Number	Population [a]	Streetcars	Trolleybusses	Motorbusses	Busses only	Net total	Number	Population
Total urban	3,442	74,423,702	269	54	1,193	702	1,312	2,130	11,844,124
1,000,000 or more	5	15,910,866	5	1	5		5		
250,000 to 1,000,000	32	14,284,473	31	2	32	1	32		
100,000 to 250,000	55	7,792,650	24	5	54	30	55		
50,000 to 100,000	107	7,343,717	44	8	105	55	107		
25,000 to 50,000	212	7,391,748	37	5	199	172	207	5	131,662
15,000 to 25,000 [c]	292	5,493,012	36	6	264	228	274	18	295,440
10,000 to 15,000 [d]	375	4,504,103	29	2	213	174	230	145	1,691,773
2,500 to 10,000 [e]	2,364	11,703,133	63	25	321	42	402	1,962	9,725,249

[a] Population and number of places from Bureau of the Census, 1940.
[b] Figures under "streetcars," "trolleybuses," and "motorbuses" may include a combination of more than one type.
[c] 10 cities, population 182,217, estimated on basis of 212 replies.
[d] 23 cities, population 266,797, estimated on basis of 352 replies.
[e] Estimated on basis of 341 cities surveyed in this class.

Source: Automobile Manufacturers Association, *Automobile Facts and Figures*, 1941.

The number of bus operators engaged in interstate commerce in 1939 was estimated by the Bureau of Motor Carriers of the Interstate Commerce Commission to be 1554. These carriers operated 16,259 vehicles, performing 696,593,651 miles of bus service, and transporting 472,592,440 passengers.

Class I interstate common carrier busses [10] in 1939 controlled 66 percent of the total number of vehicles operated. They earned 84 percent of the total revenues and accounted for 84 percent of the total expenses. They operated nearly three times as many bus-miles as Class II [11] and Class III carriers, or 73 percent of the total; and carried nearly three times the number of passengers, or 72 percent of the total number of passengers carried. Table 15 shows a composite of bus operations for 1940.

TABLE 14.—*Operations of Classes I, II, and III Passenger Motor Carriers, 1939*

	Class I	Classes II and III	Total
Number of carriers	205	1,349	1,554
Vehicles operated	10,658	5,601	16,259
Bus-miles operated	511,285,223	185,308,428	696,593,651
Passengers carried	339,315,792	133,276,648	472,592,440

Source: Tentative estimate, Bureau of Motor Carriers, Interstate Commerce Commission, based upon returns of carriers and estimates made to compensate for reports not received.

[10] Earning annual gross operating revenues over $100,000.

[11] Class I carriers have operating revenues of $100,000 or more; Class II have revenues of $25,000 to $100,000 and Class III under $25,000.

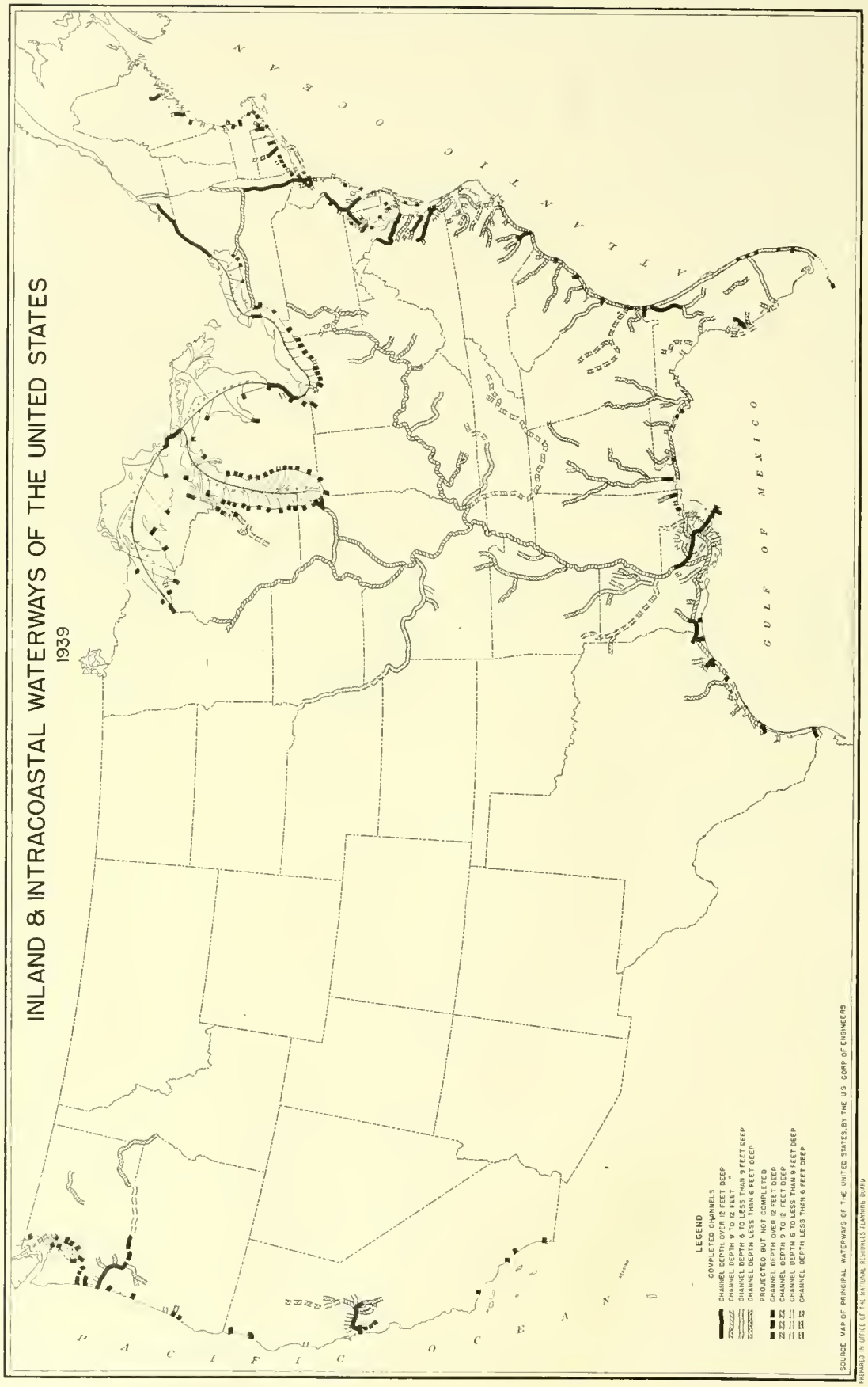
INLAND & INTRACOASTAL WATERWAYS OF THE UNITED STATES
1939
ATLANTIC OCEAN
GULF OF MEXICO
PACIFIC OCEAN
LEGEND
COMPLETED CHANNELS
CHANNEL DEPTH OVER 12 FEET DEEP
CHANNEL DEPTH 9 TO 12 FEET
CHANNEL DEPTH 6 TO LESS THAN 9 FEET DEEP
CHANNEL DEPTH LESS THAN 6 FEET DEEP
PROJECTED BUT NOT COMPLETED
CHANNEL DEPTH OVER 12 FEET DEEP
CHANNEL DEPTH 9 TO 12 FEET DEEP
CHANNEL DEPTH 6 TO LESS THAN 9 FEET DEEP
CHANNEL DEPTH LESS THAN 6 FEET DEEP
SOURCE MAP OF PRINCIPAL WATERWAYS OF THE UNITED STATES, BY THE U.S. CORP OF ENGINEERS
PREPARED IN OFFICE OF THE NATIONAL RESOURCES PLANNING BOARD

FIGURE 11

TABLE 15.—*Motorbus Operations, 1940*

Type of service	Miles of highway route covered	Revenue bus-miles operated (thousands)	Total revenue passengers transported (thousands)	Passenger-miles of service performed (millions)
Total	343,300	1,934,045	3,986,837	20,204
City, including city-suburban service	28,300	1,049,618	3,633,248	9,681
Intercity	315,000	884,084	350,089	10,048
Sightseeing and charter-hire		343	3,500	475

Source: Compiled from Stocks, Carl W., "The Size and Growth of the Bus Industry," *Bus Transportation*, January 1941, pp. 48-50, supplemented by estimates supplied by Mr. Stocks to National Resources Planning Board, May 21, 1941.

TABLE 16.—*Summary Statistics for Class I and Classes II and III Property Motor Carriers, 1939*

Item	Total	Class I	Classes II and III	Percent of total, class I
Number of carriers	26,169	1,112	25,057	4.2
Vehicles operated [a]	135,986	51,033	84,953	37.5
Miles operated	3,761,444,187	1,727,928,842	2,036,515,345	45.9
Tons carried	115,371,429	63,525,934	81,845,495	43.7

[a] Represents power units (trucks and tractors) only and does not include trailers and semitrailers.

Source: Computed from estimates of the Bureau of Motor Carriers, Interstate Commerce Commission, March 21, 1941.

Transportation of freight by highway.—In table 16 summary statistics are shown of the operations of Class I and Classes II and III motor carriers of freight for 1939. Although Class I carriers represent only 4.2 percent of the total they operated 37.5 percent of the vehicles.

The number of Class I carriers of property in each district and region and the percentage distribution among districts and regions based on the reports of 944 Class I motor carriers of property, are shown in table 17. Of the total, 62.4 percent operate in the eastern district.

Domestic Water Transportation

The domestic water transportation system of the United States comprises both natural and improved waterways. The facilities include harbors, ocean routes, rivers, canalized rivers, canals, and the Great Lakes and connecting waterways together with such necessary adjuncts to navigation as lighthouses, lightships, radio-beacons, buoys, weather information signals, and radio-broadcasting facilities. The estimated waterway investment includes $3,200,000,000 invested in waterway improvements [12] and $3,500,000,000 in public and private terminal facilities.

Domestic water transportation may be divided into two broad groups: Coastwise and intercoastal and inland. In figures 11 and 12 are shown the principal routes and channels.

[12] Estimate of Board of Engineers, U. S. Army.

TABLE 17.—*Geographical Distribution of Class I Motor Carriers of Property*

District or region	Number of operators	Percent of U. S. total	Percent of district total
Total, United States	944	100.0	
Eastern district	589	62.4	100.0
New England region	96	10.2	16.3
Middle Atlantic region	237	25.1	40.2
Central region	256	27.1	43.5
Southern district	73	7.7	100.0
Western district	282	29.9	100.0
Northwestern region	37	3.9	13.1
Midwestern region	60	6.4	21.3
Southwestern region	70	7.4	24.8
Rocky Mountain region	13	1.4	4.6
Pacific region	102	10.8	36.2

Source: Interstate Commerce Commission.

TABLE 18.—*Coastwise and Intercoastal Trade of the United States, by Ports and Coasts, 1939*

Coast and port	Receipts (Short tons)	Shipments (Short tons)
All Atlantic ports	101,702,275	40,901,345
Fifteen principal Atlantic ports	93,776,841	35,803,238
New York Harbor, N. Y	34,818,500	7,216,324
Philadelphia, Pa	17,193,431	4,377,217
Boston, Mass	12,824,967	1,118,266
Baltimore, Md	5,603,446	2,031,018
Providence, R. I	4,613,916	559,806
New Haven, Conn	3,176,587	709,400
Hampton Roads, Va. (including Norfolk and Newport News)	2,993,509	17,166,307
Portland, Maine	2,292,587	482,844
Savannah, Ga	1,734,027	735,165
Albany, N. Y	1,669,695	76,491
Bridgeport, Conn	1,649,378	233,131
Jacksonville, Fla	1,532,737	657,161
Wilmington, N. C	1,431,800	4,701
Charleston Harbor, S. C	1,205,214	209,518
Fall River, Mass	1,037,047	225,889
Gulf ports	11,487,398	79,148,114
Six principal Gulf ports	8,858,883	56,592,380
New Orleans, La	2,323,342	3,220,854
Houston, Tex	1,486,596	15,395,672
Beaumont, Tex	1,350,849	15,365,428
Tampa, Fla	1,311,111	1,230,810
Texas City, Tex	1,263,775	7,265,091
Port Arthur, Tex	1,123,210	14,114,525
Pacific ports	32,806,510	35,734,536
Five principal Pacific ports	25,884,119	16,654,884
San Francisco Bay, Calif	12,856,338	5,643,585
Los Angeles, Calif	5,067,523	7,592,364
Portland, Oreg	3,306,040	1,258,631
Seattle, Wash	2,952,059	1,290,375
Honolulu, Hawaii	1,702,159	869,929

Source: War Department, *Annual Report of the Chief of Engineers, U. S. Army, 1939*, part 2, pp. 6-13.

Coastwise and Intercoastal Traffic

In table 18 combined coastwise and intercoastal receipts and shipments for major ports are shown.[13] The coastwise and intercoastal trade is conducted through 259 ports of which 150 are on the Atlantic, 30 on the Gulf of Mexico, and 79 on the Pacific. Traffic was distributed in 1939 among the seaboards as follows: Atlantic, 69.6 percent of the receipts and 26.3 percent of the shipments; Gulf of Mexico, 7.9 percent of the receipts and 50.8 per-

[13] Coastwise and intercoastal traffic, as the terms are used here, include all traffic transported on the ocean, Gulf of Mexico, and important arms of the ocean or Gulf, excepting traffic between points on the Chesapeake Bay and Puget Sound not reported separately. The data include also traffic to or from ports in the Virgin Islands, Puerto Rico, Alaska, Hawaii, and Wake Island. The figures do not include foreign import or export traffic, nor other domestic, internal, intraport and local traffic.

cent of the shipments; and Pacific, 22.5 percent of the receipts and 22.9 percent of the shipments.[14] At many of these ports the tonnage is small and occasional. Traffic is concentrated primarily at 26 ports through which 88 percent of the receipts and 70 percent of the shipments were handled in 1939. The 15 principal Atlantic Coast ports handled over 92 percent of the receipts and 87 percent of the shipments at all Atlantic ports. These same ports handled more than 64 percent of the receipts and nearly 23 percent of the shipments for the entire country. The six principal Gulf of Mexico ports handled over 77 percent of the receipts and 71 percent of the shipments at all Gulf ports. Over 36 percent of the total United States coastwise and intercoastal shipments came from these six ports, indicating the importance and concentration of petroleum traffic. Four mainland ports and Honolulu together handled 79 percent of the total receipts and 46 percent of the shipments in the Pacific domestic trade. Traffic is less concentrated at major Pacific ports because lumber and petroleum are shipped from a number of smaller points.

[14] Basic data from *Annual Report of the Chief of Engineers, U. S. Army*, part 2, War Department, Corps of Engineers, 1940.

Coastwise Facilities and Services

The coastwise transportation system of the United States consists of five subdivisions: (1) Service among North Atlantic ports north of Norfolk; (2) service among South Atlantic ports, Norfolk and south; (3) service between North and South Atlantic ports; (4) trade between North and South Atlantic ports on the one hand and ports on the Gulf of Mexico on the other; and (5) service among ports on the Pacific Ocean and

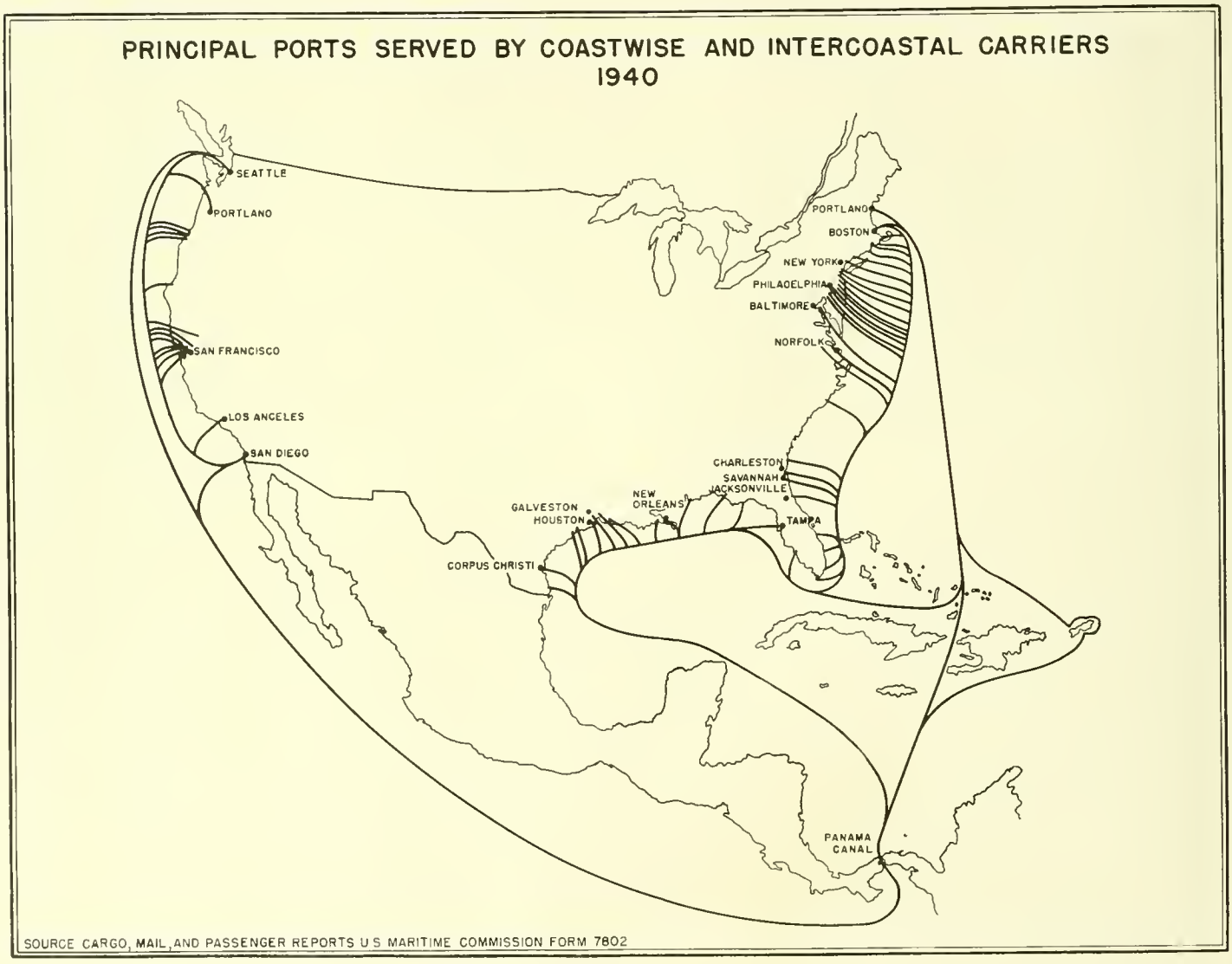

FIGURE 12

its tributaries. The coastwise trade has increased irregularly from a little over 100 million tons in 1933 to more than 140 million tons in 1939. (Table 19.)

TABLE 19.—*Coastwise Traffic of the United States, 1933 to 1939*

Year	Volume of traffic (thousands of short tons)	Year	Volume of traffic (thousands of short tons)
1933	101,826	1937	141,685
1934	103,724	1938	131,928
1935	107,376	1939	112,318
1936	124,842		

Source: United States Maritime Commission, Section of Special Studies. Derived by deducting intercoastal traffic as shown in monthly reports of the Panama Canal from the annual figures reported in the *Annual Report of the Chief of Engineers, U. S. Army*, part 2, War Department, Office of the Corps of Engineers.

Employed in coastwise commerce is a fleet of 629 ships consisting of dry-cargo vessels and tankers. The dry-cargo vessels on December 31, 1940, included 59 combination passenger and freight and 271 freight vessels, a total of 330 vessels, of which 286 were in active service. All 299 tankers were in active service. The number and tonnage of vessels of United States registry employed in the coastwise trade as of December 31, 1940, are shown in table 20. The 286 active dry-cargo vessels, with an aggregate of 1,173,519 gross registered tons, averaged 4,103 gross registered tons each, whereas the 44 laid-up vessels, with an aggregate of 153,625 gross registered tons, averaged 3,491 gross registered tons. These figures show a tendency to keep the larger vessels in service.

A comparison of the vessels in service at the end of 1940 with those in service in September, 1938, shows a decrease of nearly 100 vessels in the coastwise trade. The total number of dry-cargo vessels decreased from 432 to 330 whereas the total number of tankers increased from 293 to 299. The number of laid-up dry-cargo vessels decreased sharply due to the demand for vessels for defense purposes and sales to foreign buyers. The relatively large average gross registered tonnage of the tankers in 1940 is explained by the fact that many of these are relatively new, and indicates the trend toward larger size vessels.

The intercoastal trade is served by combination passenger-freight vessels, general dry-cargo freight vessels, specialized dry-cargo freight vessels and tankers. These vessels are operated by: (1) Common carrier steamship lines over regular routes; (2) tramp or contract carrier vessels in irregular services; (3) private operators which transport the goods of the proprietary industries; (4) operators which transport both goods owned by the proprietary industries and goods shipped by outsiders; and (5) operators which are engaged exclusively in one direction in the transportation of goods of proprietary industries as private operators and in the reverse direction are engaged in regular-line common carrier transportation services.

Intercoastal Facilities and Services

The intercoastal trade takes place between ports on the Atlantic Ocean or Gulf of Mexico and ports on the Pacific coast. Because of slides in the Panama Canal shortly after it was opened to traffic and because of the diversion of intercoastal vessels to other services during the World War, the importance of this route was considerably diminished until after the close of the war. Despite the availability of the all-water route via the Panama Canal, some traffic continues to move over other routes, particularly by way of the combination of coastwise steamship and rail services through Gulf ports.

TABLE 20.—*Dry-cargo and Tank Vessels of 1,000 Gross Registered Tons or More in Coastwise Service, Dec. 31, 1940*

Type and status	Number	Gross registered tons	
		Aggregate	Average
DRY-CARGO VESSELS			
Combination	59	300,842	5,099
Active	37	207,012	5,595
Laid-up	22	93,830	4,265
Freight	271	1,026,302	3,787
Active	249	966,507	3,882
Laid-up	22	59,795	2,718
TANKERS			
Total	299	2,152,615	7,199
Active	299	2,152,615	7,199
Laid-up			
TOTAL DRY-CARGO AND TANK VESSELS			
Total	629	3,479,750	5,532
Active	585	3,326,134	5,686
Laid-up	44	153,625	3,491

Source: U. S. Maritime Commission, Section of Special Studies.

The intercoastal trade has two principal subdivisions, the one connecting the ports on the North and South Atlantic with Pacific coast ports, and the other connecting Gulf ports with the Pacific coast ports. Representative distances via sea and rail routes are shown in table 21.

TABLE 21.—*Intercoastal Distances by Rail and by Steamship*

Ports	Approximate distance in statute miles			Ratio railroad to steamship miles (percent)
	By intercoastal steamship	By railroad	Difference	
New York to San Francisco	6,051	3,116	2,935	51.5
New Orleans to San Francisco	5,392	2,352	3,040	43.6
Boston to San Francisco	6,262	3,219	3,043	51.4
New York to Seattle	6,944	2,889	4,055	41.6

Source: Based on data supplied by the Interstate Commerce Commission.

The volume of intercoastal freight traffic can be measured by transits through the Panama Canal. The an-

nual domestic intercoastal traffic through the Panama Canal is shown in table 22 for selected fiscal years from 1925 to 1940. This table indicates that the preponderance of traffic is east-bound but the percentage of west-bound to east-bound traffic has been increasing, particularly during the past 5 years, chiefly because of a substantial reduction in the east-bound movement while the west-bound movement was increasing slightly.

TABLE 22.—*Intercoastal Traffic Through the Panama Canal for Selected Fiscal Years, 1925 to 1940*

[Thousands of short tons]

Fiscal year	Total	Atlantic to Pacific	Pacific to Atlantic	Ratio of west-bound to east-bound (percent)
1925	10,636	2,479	8,157	30.4
1930	11,748	3,541	8,207	43.1
1935	8,918	2,421	6,497	37.3
1940	8,640	3,132	5,508	56.9
Annual average:				
1924–35	11,929	3,028	8,901	34.0
1936–40	8,400	2,556	5,844	43.7

Source: *Annual Report of the Governor of the Panama Canal*, fiscal years 1924 and through 1940.

The number of vessels engaged in intercoastal service has changed radically since September 1938. At that time, there were 6 (5 active and 1 inactive) combination passenger and dry-cargo freight vessels aggregating 47,567 gross registered tons, engaged in the intercoastal trade. In addition to the vessels with combination freight and passenger facilities there were 140 dry-cargo freight vessels aggregating 812,997 gross registered tons. Six tankers aggregating 47,660 gross registered tons were also in the intercoastal trade, all in active service. At the close of 1940, there were no combination passenger-freight dry-cargo vessels in the intercoastal trade, but 113 dry-cargo freighters with an aggregate tonnage of 652,097 gross registered tons remained in service. The tanker fleet, however, had increased to 12 vessels, aggregating 93,169 gross registered tons.

Inland Water Transportation

Inland water transportation is divided into two sections, the Great Lakes and their connecting channels; and the rivers, canals, and intracoastal waterways. The location of the Great Lakes and inland waterways is channels with depth of 9 feet or more and the ton-miles shown in figure 11. Table 23 shows the miles of channels with depth of 9 feet or more and the ton-miles of traffic in 1939.

Great Lakes Transportation

The Great Lakes have an area of more than 95,000 square miles and 8,300 miles of shore line. These inland seas form the arteries for a very large movement of

TABLE 23.—*Miles of Channel 9 feet or More in Depth and Ton-miles of Traffic on Inland Waterways and the Great Lakes, 1939*

Waterway	Miles of channel 9 feet or more in depth	Percent of total	Ton-miles (thousands)	Percent of total
Great Lakes	1,541	14.3	[a] 76,334,894	79.3
Inland waterways	9,228	85.7	19,914,549	20.7
Total	10,769	100.0	96,249,443	100.0

[a] Includes 22,950,000 ton-miles reclassified as Great Lakes instead of inland waterways.

Source: War Department, Chief of Engineers, U. S. Army.

traffic between the Midwest and the Atlantic seaboard of the United States and Canada, as well as some foreign import and export commerce. From the head of deep-draft ocean navigation on the St. Lawrence River at Montreal to the head of navigation at the western end of Lake Superior and to the southern end of Lake Michigan, the distances are 1,340 and 1,260 miles, respectively, including approximately 1,000 miles of open-lake navigation, 60 miles through improved natural waterways and 27 miles through connecting canals. In addition to the St. Lawrence outlet from the Great Lakes, the New York State Barge Canal system also connects with the Atlantic seaboard.

Domestic traffic on the Great Lakes moves primarily between lake ports, but also moves to and from the Atlantic seaboard. The volume of this commerce for several years is shown in Table 24. In addition there is a large volume of trade between United States and Canadian ports and a smaller volume to and from other nations.

TABLE 24.—*Commerce at Ports on the Great Lakes, Selected Years 1929 to 1939*

[Thousands of short tons]

	1929	1932	1937	1939
Gross total	297,366	94,494	296,494	254,048
Net total eliminating duplications	161,344	54,913	161,095	141,577
Lake Superior	84,353	13,171	82,622	60,345
Lake Michigan	66,414	23,778	62,303	59,916
Lake Huron	15,789	4,578	14,038	11,649
Black and St. Clair Rivers [a]	879	528	734	399
Detroit River [b]	13,992	7,508	14,919	16,020
Lake Erie	111,479	42,742	118,792	101,554
Niagara River	752	78	578	669
Lake Ontario	3,039	1,807	1,726	2,734
St. Lawrence River	1,369	831	781	762

[a] Port Huron, Mich., on the Black and St. Clair Rivers.
[b] Detroit, River Rouge, Wyandotte, Riverview, and Trenton, Mich.

Source: Compiled from *Transportation on the Great Lakes*, Corps of Engineers, U. S. Army, War Department Transportation Series No. 1 (revised 1937), supplemented by data from records of the Board of Engineers for Rivers and Harbors.

Traffic on the Great Lakes consists principally of bulk movements of such commodities as grain, iron ore, iron and steel products, coal, stone, sand and gravel, cement, petroleum, and forest products. Bulk commodities are transported chiefly by vessels specially constructed to handle them. Small quantity movements of bulk traffic

and miscellaneous merchandise are transported chiefly by the merchandise or package freight lines which operate over regular routes between lake ports. Although the bulk carriers in the Great Lakes trade are engaged chiefly in the transportation of solid shipload lots of traffic, they differ from the steamships operating in contract carrier or tramp trade in other parts of the world in that they operate over fairly well defined routes.

Passenger traffic is performed by steamship lines operating in regular route services between ports, by excursion steamships, and by ferryboats. The number of passengers carried on the Great Lakes in 1939 is shown in table 25.

TABLE 25.—*Passenger Traffic on the Great Lakes, 1939*

Types of service	Number of passengers
Total	10,033,956
Regular	2,567,448
Ferry	4,622,339
Excursion	2,844,169

Source: War Department, Corps of Engineers, *Commercial Statistics, Water-borne Commerce of the United States*, 1940.

The vessels engaged in Great Lakes service comprise a large percentage of the total merchant marine of the United States. The number decreased from 3,016 vessels of 3,233,469 gross registered tons in 1920 to 2,342 vessels of 3,819,106 gross registered tons in 1938. The vessels other than Government vessels operating on the Great Lakes fall into eight classes: Freighters, passenger and merchandise or package freight vessels, railroad car ferries, passenger vessels, sand and gravel boats, tugs and towboats, fishing craft, and yachts and pleasure craft. There has been a tendency to construct large vessels for the transportation of bulk traffic, particularly ore, grain, stone, and coal and to equip such bulk freighters as self-unloading vessels or for carrying special commodities. Many of the recently constructed lake freighters have a gross registered tonnage exceeding 8,000 tons and cargo capacity of over 11,000 tons.

Inland Waterways

The inland waterways system of the country, excluding the Great Lakes and connecting channels, consists of 25,392 miles of improved waterways, of which 14,327 miles or 54 percent are 6 feet or more in depth and 9,228 miles or 35 percent are 9 feet or more. (See table 26.) For economical inland transportation a 9-foot controlling depth is generally set as the standard channel. The 12,065 miles under 6 feet include many waterways on which improvements consist of little more than the periodic removal of snags or provision for seasonal navigation of flatboats and rafts. The Gulf coast section is by far the most important as measured by mileage and traffic. In 1939, the rivers, canals and intracoastal waterways in that section had 5,630 miles of waterway 9 feet or more in depth, or 61 percent of the total of 9,228 miles, and handled more than 15 billion ton-miles or 76.3 percent of the total traffic.

The volume of commerce transported over the inland waterways has been increasing substantially in recent years. It amounted to nearly 20 billion ton-miles in 1939, an increase of 49 percent in 5 years. In spite of this expansion it still constitutes less than 4 percent of the total ton-miles of inland intercity freight traffic. In table 26 are shown the ton-miles of freight transported over the various groups of inland waterways in 1939.

TABLE 26.—*Miles of Inland Waterways Excluding Great Lakes, and Traffic Thereon by Territories, 1939*

Location	Under 9 feet	9 feet and over	Traffic (thousands of ton-miles)
Total inland waterways (excluding Great Lakes)	17,164	9,228	[a] 19,914,549
Atlantic coast territory	3,931	3,279	3,506,798
Rivers and canals	3,496	2,338	
Intracoastal waterways	435	941	
Gulf coast territory	11,375	5,630	15,186,436
Mississippi Valley rivers and canals	8,036	4,037	
Other Gulf coast rivers and canals	3,339	661	
Intracoastal waterways		932	
Pacific coast territory	1,858	319	1,221,315
Rivers and canals	1,059	319	
All other waterways	799	0	

[a] Excludes 22,950,000 ton-miles reclassified as Great Lakes tonnage.

Source: War Department *Annual Report of the Chief of Engineers, U. S. Army*, 1940, part 2, tables 7, 8, and 10.

TABLE 27.—*Ton-Miles of Freight Transported on the Inland Waterways, by Systems, and Percentage Distribution of this Traffic, 1939*

System	Millions of ton-miles	Percent of total
All inland waterways	19,937	100.0
Atlantic coast rivers	1,923	9.6
Gulf coast rivers	593	3.0
Pacific coast rivers	1,209	6.1
Mississippi River system, including Ohio River and tributaries	12,369	62.0
Intracoastal and other waterways	3,843	19.3

Source: Based on data contained in the *Annual Report of the Chief of Engineers U. S. Army*, 1940, part 2, War Department.

The major portion of traffic on the inland waterways consists of bulk commodities in raw or semimanufactured form. From 1935 to 1939 this traffic averaged 92 percent of the total. Most of the commodities move in heavy or bulky loads and do not require as fast delivery as finished products. They are generally of low value and require a cheap form of transport. Moreover, the nature of the commodities is such that they are not readily suspectible to damage or deterioration from handling, delay in transit, or from adverse weather conditions. The greater proportion of them is not dependent on railroad stand-by service, for they can be transported on the waterways during open seasons and stored

during closed seasons. The principal commodities transported on the various inland waterways are coal and coke, petroleum and its products, sand and gravel, and iron and steel. The passenger traffic is relatively unimportant. The principal services offered include regular scheduled trips, ferry service, and excursions. In 1939 there were 17,929,630 passengers carried on the rivers, canals, and connecting channels, not including passengers on river ferries that make no use of channels in crossing.

Private carriers transport the traffic of the industry or business enterprise owning the facilities. The most prominent private carriers on inland waterways are those owned by the steel, coal, cement, and petroleum companies. Private carriers transporting sand and gravel are also numerous, but they do not rank in importance with the first-mentioned private carriers, because the movement of sand and gravel involves only short hauls and is apt to be localized. Private carriers usually transport such commodities as petroleum and petroleum products, coal, iron and steel, scrap iron, molasses, lumber and logs, sulphur, stone, asphalt, coke, pig iron, chemicals, and building materials. These commodities are generally carried in full barge-load lots. These services are operated irregularly because the equipment is not ordinarily moved to destinations until fully loaded.

Barges owned by private carriers are also engaged at times in contract transportation, operating in some instances as private carriers in one direction and as common carriers in another. The private carriers, in such cases, leave their roles as private operators and function as contract or common water carriers, but it can safely be said that most of their traffic is of a proprietary nature.

Contract carriers reassumed a position of importance following the close of the World War. They are now engaged primarily in bulk movements of minimum cargo quantities which are usually much in excess of railroad carload lots. They generally maintain no scheduled services, and do not operate between fixed termini. They do not participate in joint rates or interchange arrangements with rail carriers and provide for no absorption of switching or handling charges at terminal ports.

Common carriers on inland waterways operate over regular routes and between fixed termini, interchange freight with rail lines, and operate under joint rates. Traffic carried by the common carriers consists principally of merchandise or package freight, and their service corresponds more closely to rail service than that of other water carriers.

There were 7,910 commercial vessels operating on the inland waterways at the beginning of 1939 (table 28). Floating equipment on the inland waterways is relatively new. Of the vessels operating in 1939, 26.5 percent were under 10 years old, 55 percent were under 15 years, and 74 percent were under 20 years. The number of commercial vessels increased 64 percent during the 10 years preceding 1939. This expansion was caused mainly by a 129 percent increase in towboats and a 166 percent increase in steel barges. At the same time the proportions of self-propelled freight vessels and wooden barges decreased substantially.

TABLE 28.—*Commercial Vessels on the Inland Waterways, Excluding the Great Lakes, January 1, 1939*

Type of vessel	All regions	Mississippi Valley	Gulf coast	Atlantic coast	Pacific coast
All commercial vessels	7,910	4,063	726	2,366	755
Total, self-propelled vessels [a]	1,331	398	126	539	268
Tug-tow	1,010	389	115	308	198
Freight	85	5	4	54	22
Freight-passenger	69	3	----------	47	19
Passenger	48	1	1	35	11
Tanker	119	----------	6	95	18
Total, non-propelled vessels	6,579	3,665	600	1,827	487
Total	5,533	3,294	295	1,529	415
Dry-cargo, steel	4,118	2,660	181	1,009	268
Dry-cargo, wood	1,415	634	114	520	147
Total	1,046	371	305	298	72
Liquid-cargo, steel [b]	902	339	250	269	44
Liquid-cargo, wood [b]	144	32	55	29	28

[a] These vessels include tugs and towing vessels of 100 I. H. P. or more; freight, passenger, and tanker vessels of 100 g. r. t. or more; and cargo barges having a capacity of 100 short tons or more.

[b] Nonpropelled liquid-cargo vessels include barges specially designed to carry both dry-cargo and petroleum or other liquid cargo but are classified as tank barges by the Bureau of Marine Inspection and Navigation, U. S. Department of Commerce.

Source: U. S. Maritime Commission, Section of Special Studies.

The largest common carrier on the inland waterways is the Government-owned Inland Waterways Corporation. It operates fleets of tow boats and barges on the Mississippi, Illinois, Missouri, and Warrior river systems. Its equipment includes 25 tow boats, one line tug, one harbor tug, and 292 all steel barges ranging in capacity from 500 to 3,000 tons. In 1940 it transported 2,287,154 tons of freight, the ton-mileage being 1,892,825,754. In 1939 it handled 61.4 percent of all the freight carried by the three largest common carriers operating on the Mississippi River and its tributaries. Its business is not confined to freight originating at or consigned to destinations located directly on the river banks; in 1940 over 66 percent of its total traffic consisted of freight interchanged with the railroads.

Air Transportation

Airway Facilities

An airway is an air route connecting air traffic centers or airports, supplied with intermediate landing fields at suitable intervals, and equipped with aids to air navigation. The Federal Government constructs, maintains, and operates 76 percent of the domestic mileage over which scheduled air services are operated. Facilities consist principally of radio marker and range bea-

cons, radio broadcast stations, teletype service, weather reporting stations, and intermediate and auxiliary landing fields.

In January 1941, the airway system consisted of 94,079 miles of which 41,054 were domestic routes and 53,025 were foreign and territorial services. This represents an increase of 65 percent over 1929 for the domestic routes and 363 percent for foreign and territorial routes served by American companies. Table 29 shows the mileage of airways within the United States and abroad served by American companies for the years 1929 to 1939.[15] The Federal Airways System, which includes all air routes receiving Federal aid, covered 30,480 lighted operating miles in the continental United States on December 31, 1940, and there were 496 additional miles under construction.

TABLE 29.—*Miles of Airway Served by Scheduled U. S. Air Carriers, 1929, 1934, and 1939*

Year	Total	Domestic	Foreign and territorial
1929	36,330	24,874	11,456
1934	50,801	28,084	22,717
1939	80,109	36,581	43,528

Source: Civil Aeronautics Administration.

Table 30 shows the progress of communication and airway lighting aids from 1930 to 1940.

TABLE 30.—*Airway Communication and Lighting Facilities for 1930, 1935, and 1940*

Type of facility	1930	1935	1940
Communication:			
Radio broadcast stations	45	74	111
Radio range beacon stations	33	137	281
Radio marker beacons	6	57	42
Weather reporting airway and airport stations [a]	143	203	376
Miles of teletypewriter service [b]	8,400	13,260	40,312
Weather bureau, first order stations [c]	209	191	146
Airway lighting:			
Revolving beacons	1,290	1,657	2,045
Flashing beacons	362	211	216
Beacons, privately owned and certified	140	330	720
Intermediate landing fields lighted	347	282	289
Mileage lighted	15,258	22,012	30,480

[a] Weather Bureau and C. A. A. operated, equipped with long-line teletypewriter service.
[b] Includes weather reporting and traffic control teletypewriter service.
[c] Not including airport stations.

Source: Civil Aeronautics Administration.

Airports

Airports can be classified as terminal airports,[16] intermediate landing fields where areas are provided for landing and take-off along the air routes to promote the safety of air commerce, and auxiliary landing fields for emergency landings. Between 1925 and 1932 the number of airports more than doubled, but since then increase in numbers has not been so great. The number of airports on January 1, 1941, exceeded that of December 1932, by only 10 percent, but the composition of the total changed so that private and commercial airports now constitute a much smaller proportion than formerly. As of June 1, 1941, there were 2,550 airports, only 64 percent of the number which the Civil Aeronautics Administration has estimated will be necessary by 1945 to accommodate the greatly increasing air commerce and the needs of national defense. Table 31 shows the number of airports existing in selected years from 1930 to 1940.

TABLE 31.—*Number of Airports, by Types, 1930, 1935, 1940*

Type of airport [a]	1930	1935	1940
Total number of airports	1,782	2,368	2,331
Terminal airports	1,188	1,447	1,535
Commercial	564	552	496
Municipal	550	739	788
Military, naval, and miscellaneous	74	156	251
Intermediate landing fields	354	291	289
Lighted	347	282	289
Unlighted	7	9	0
Auxiliary landing fields, marked	240	630	507

[a] Does not include any seaplane landing facilities.

Source: Civil Aeronautics Administration.

At present there is a shortage of well-equipped airports. Many of the existing landing facilities are poorly located, inadequately drained, deficient in storage and repair facilities, lacking in lighting or radio communication systems, and provided with inadequate or unsurfaced runways. In 1939, the latest year for which detailed data are available, 53 percent of the airports had very limited facilities or none at all; 33 percent had minimum facilities for day flying only; 7 percent had minimum requirements for day and night operations; and only 7 percent had complete and adequate facilities for all types of operation.

Seaplane bases and anchorages on January 1, 1941, totaled 325, of which only 5 percent were partially or fully lighted. Anchorages provide tie-up and fueling facilities only, whereas bases are equipped for servicing including hangar, ramp, beach repairs, aviation fuel, etc. As of January, 1941, there were 53 civil bases, 243 anchorages, and 29 military or coast guard bases.

The boom in airport construction from 1926 to 1931 represented almost exclusively investments by municipal and private capital in approximately equal proportions. Since 1933, however, about three quarters of all funds for airport construction have been provided by the Federal Government. Private airports, as a rule, have not been financially successful. In 1940 approximately half the civil airports, excluding intermediate landing fields, were publicly owned, and about 60 percent were publicly operated.

[15] A map showing the system of scheduled air lines in the United States appears in figure 16.

[16] The term, terminal airport, is used here to designate a large airport where major airlines terminate or connect with other major lines.

Scheduled Air Carrier Services

American companies provide both domestic and foreign scheduled air services. In 1940 there were 22 scheduled air carriers serving 94,079 miles of route. Of these, 16 companies operated 41,054 miles of route within the United States and offered 211 services[17] of which 210 included passengers, 165 mail, and 211 express. Eight companies offered 50 foreign and territorial services over 53,025 miles of routes. Since 1930 the number of operators has decreased over 50 percent, a decrease accounted for entirely by domestic companies. The total miles of route, however, have grown 90 percent, and the number of services offered has increased 73 percent. The number of revenue miles flown annually over domestic routes has increased from 31,992,634 in 1930 to 108,800,436 in 1940; for foreign and territorial routes the rise was from 4,952,569 to 10,716,827 in the same period.

The number of planes in service and reserve on domestic scheduled air lines has decreased from 497 in 1930 to 358 in 1940. This decrease in planes has been offset by the great increase in the average number of seats per plane which rose fom 6.6 in 1932 to 16.5 in 1940. Planes on domestic routes flew an average of 303,140 miles in 1940. Planes on foreign routes flew 10,716,827 revenue miles in 1940, averaging 130,693 miles per plane.

Passenger Traffic

Transportation of mail was formerly the principal source of revenue for air carriers, but since 1935 passenger business has contributed a larger proportion of the revenue. In 1935, 663,261 revenue passengers in domestic services, were carried 279,375,902 passenger-miles, an average distance of 421 miles; in 1940, 2,727,820 revenue passengers traveled 1,041,173,558 passenger-miles, an average distance of 382 miles. A survey made by the Civil Aeronautics Authority in November 1939 showed that approximately 70 percent of the passengers traveled distances under 500 miles and accounted for about 40 percent of all passenger-miles. The domestic revenue passenger load factor has increased irregularly from 48.8 in 1935 to 57.9 in 1940 at the same time that the number of seats per plane increased approximately 60 percent. Seat-miles flown rose 214 percent from 572,546,530 in 1935 to 1,797,329,431 in 1940. In table 32 selected passenger traffic statistics are shown for the years 1930, 1935, and 1940.

Table 32.—*Selected Passenger Traffic Statistics of Scheduled Air Carriers, 1930, 1935, and 1940*

	1930	1935	1940
Passenger mileage of domestic, foreign, and territorial airways	36,136	52,387	94,079
Number of passengers, revenue, and non-revenue:			
Domestic	374,935	746,946	2,959,480
Foreign and territorial	42,570	127,170	225,798
Passenger-miles flown, revenue and non-revenue:			
Domestic (thousands)	84,015	313,906	1,147,445
Foreign and territorial (thousands)	19,733	48,465	117,719
Passenger seat-miles flown, domestic routes (thousands)	----------	572,547	1,797,329
Revenue passenger load factor, domestic routes [a]	----------	48.80	57.93

[a] Ratio of revenue passenger-miles to seat-miles flown.

Source: Civil Aeronautics Administration. Domestic air carriers are American companies operating within the continental United States. Foreign and territorial carriers are American companies operating in United States territories and in foreign countries.

Although passenger schedules include all the large cities of the country, the great bulk of the business is concentrated in the industrial section of the East in the area between Boston, New York, Washington, and Chicago. Mail and express services, on the other hand, show a much wider dispersion of traffic over the country.

The great increases in passengers transported and passenger-miles of service rendered in the last decade have resulted from a number of technological developments which have increased the safety, speed, and comfort of planes. Safety is probably the most important factor in air travel growth. Passenger fatalities on domestic lines decreased from 28.6 per 100 million passenger-miles flown in 1930 to 1.2 in 1939 and 3.0 in 1940. Although no fatalities were recorded in 1940, foreign and territorial carriers had a somewhat higher rate in previous years. Operations are no longer so severely limited by weather conditions, hence the seasonal traffic pattern has been considerably smoothed. The decrease in rates from about 12 cents per mile in 1929 to about 5.5 cents in 1941 greatly increased the demand for passenger space by putting air travel in the same price range with first-class railroad service.

Air Mail Service

In 1940 air lines served more than 90,000 miles of domestic, foreign, and territorial mail routes, nearly three and one-half times the mileage covered in 1929. Domestic routes serve the entire country with stops at 243 stations. Mail traffic is more evenly distributed geographically than passenger traffic. In 1940 domestic air lines carried 10,500,000 ton-miles of mail,[18] almost four times the volume carried in 1930. Airplanes carried 9.7 percent of the domestic, first-class, nonlocal mail in the fiscal year 1940 over an average distance of 1,440 miles.[19] Foreign mail amounted to only one-tenth of all air mail in 1940 although ton-miles transported have increased more than fivefold in the past 5 years. In table 33 is shown the volume of foreign and domestic air mail carried by American companies, 1929 to 1940.

[17] The term "air-line service" as used by the Civil Aeronautics Administration is equivalent to a published air-line schedule or service, for example, the scheduled service between New York and Chicago.

[18] Includes mail for foreign countries and United States territories carried within the continental United States.

[19] United States Post Office Department, Division of Cost Ascertainment.

TABLE 33.—*Mail Traffic of United States Air Lines, 1929 to 1940*

Year	Ton-miles, domestic	Pounds, domestic	Pounds, foreign
1929		7,099,581	672,433
1930		7,985,010	528,665
1931		9,097,411	545,800
1932		7,393,257	515,466
1933		7,362,180	173,828
1934	2,461,411	7,411,004	206,606
1935	4,132,708	13,268,730	252,244
1936	5,741,436	17,706,159	328,295
1937	6,698,230	19,505,786	426,261
1938	7,422,860	22,922,691	484,712
1939	8,584,891	26,943,420	675,422
1940	10,033,480	32,753,502	1,045,376

Source: Civil Aeronautics Administration.

In 1940 mail payments accounted for only 29 percent of the air carriers' revenue as contrasted with 92 percent in 1931. Although mail payments by the Government have been decreased by about half in the last decade, on a net weight basis they still average almost five times the equivalent passenger rate. In the fiscal year 1940, payments to air carriers for transporting mail were $18,678,921.

Express and Freight Service

In addition to passengers and mail, scheduled air lines also transport a small volume of express and freight. In table 34 the mileage of air express routes, pounds carried, and ton-miles transported by American companies for the years 1930, 1935, and 1940 are shown.

TABLE 34.—*Miles of Express Route and Volume of Air Freight and Express Transported by U. S. Air Carriers, 1930, 1935, and 1940*

	1930	1935	1940
Miles of route: domestic, foreign, and territorial	20,445	60,377	94,059
Pounds carried:			
Domestic	359,523	3,822,397	12,506,000
Foreign and territorial	109,048	1,742,740	1,682,002
Ton-miles, domestic		1,089,802	3,469,485

Source: Civil Aeronautics Administration.

A survey of traffic in 1939 indicates that the average weight of air express packages was 6 pounds and the average haul was 1,047 miles.[20] The most important commodities shipped include machinery and hardware, printed matter, store merchandise, moving-picture films, electros, valuable papers, flowers, news photos, drugs, phonograph records, and freight manifests. The tonnage of all commodities shipped by air in 1940 was less than 0.001 percent of the express tonnage on the railroads. A large potential market exists in the traffic now carried by railway express, parcel post, less-than-carload freight, motortruck, and freight-forwarder service by rail and truck. Relatively high rates on air express have thus far prevented the development of a large volume of commodity traffic.

[20] *Railway Express Agency Analysis of Air Express Traffic, April 1939*, vol. 3, "Commodities, Weights, and Distance Scales."

Private and Nonscheduled Flying

Nonscheduled civil flying has increased rapidly from 71 million miles flown in 1933 to 264 million miles in 1940. In miles flown by certificated aircraft, the greatest increase during 1940 occurred incident to pilot training. Mileage of other nonscheduled flying was: Pleasure, 79 million; commercial, 37 million; and business, 21 million. In January, 1941, there were 17,488 planes in use for nonscheduled flying. The average distance flown per plane in 1940 was approximately 15,619 miles. In 1940, 1,600,000 passengers were carried. Although the number of accidents in nonscheduled flying increased 58 percent over 1939 and the number of fatalities increased from 314 to 330, the number of miles flown per fatal accident was 91 percent above the average for the preceding 5 years.

Petroleum Pipe-Line Transport

Pipe-Line Facilities

The petroleum pipe-line system consists of pipe lines, power plants, pumping stations, storage tanks, communication facilities, and control offices. In 1939 there were approximately 61,000 miles of crude-oil trunk lines, 6,750 miles of gasoline lines, and about 5,500 miles of gathering lines.[21]

The crude trunk lines, which account for 49.7 percent of the total mileage, transport petroleum from gathering tank farms to refineries or ports. Gasoline trunk lines extend from refineries or ports to distributing points and represent 5.5 percent of total mileage. Gathering lines, comprising 44.8 percent of total pipe-line mileage, carry petroleum from the wells to tank farms, trunk pipe lines, or railroad loading racks. In table 35 pipe-line mileage is shown for the years 1926 and 1939.

TABLE 35.—*Petroleum Pipe-Line Mileage, 1926 and 1939*

Type of line	1926	1939
All lines	90,170	122,750
Crude trunk	44,470	61,000
Crude gathering	45,700	55,000
Gasoline		6,750

Source: Data for 1926 published in *Petroleum Facts and Figures*, 1939. Figures for 1939 estimates by American Petroleum Institute.

The growth of the pipe-line network has been very rapid since 1920. Prior to this time the principal movement of crude was from the midcontinent district to the Atlantic seaboard by pipe line. Since 1920, as the result of the rapid development of transportation by tanker from California and Gulf of Mexico ports to eastern refineries, the direct movement of crude by pipe line from the midcontinent has declined to a relatively small volume. A number of pipe lines in the East were

[21] Estimates of the American Petroleum Institute. Maps of the crude and gasoline lines are figures 42 and 43.

abandoned or were adapted to west-bound movements from the coast, several were converted to natural-gas lines, and one was converted to a products line. Expansion of refining facilities in the Central States, however, necessitated construction of several new pipe lines and the looping of most of the others in order to increase their carrying capacity.

Storage Facilities

Working storage facilities are provided to control the flow of oil through the lines. Other storage is required at points of origin to accommodate petroleum awaiting movement or sale or at destinations while awaiting refining or further movement. These facilities are located in the oil fields, at junction points, at points of transshipment, and at refining centers. Net stocks in tanks totalled 278,997,000 barrels and pipe-line fill was 21,553,000 barrels.[22] Storage capacity in 1936 is shown in table 36.

TABLE 36.—*Crude Petroleum Storage Facilities, June 30, 1936*

Location of facilities	Number of tanks	Capacity (thousands of barrels)
All locations	15,094	583,478
Pipe-line stations	3,390	56,078
Tank farms	8,621	423,136
Refineries	3,083	104,264

Source: United States Bureau of Mines, *Survey of Crude Oil in Storage*, 1936, 1937

Pipe-Line Traffic

Petroleum pipe lines transported 9.5 percent of the total ton-miles of intercity freight traffic in 1939 (excluding coastwise and intercoastal traffic). Pipe lines delivered 75 percent of the domestic crude oil received at refineries and carried 6 percent of the total movement of refined products. The movement of crude and refined petroleum by pipe line for the years 1931, 1935, and 1939 is shown in table 37.

TABLE 37.—*Movement of Crude and Refined Petroleum by Interstate Pipe Lines Reporting to the Interstate Commerce Commission, 1931, 1935, and 1939*

Years	Million of barrels		Average haul in miles
	Total transported	Originated	
CRUDE			
1931	1,128	489	
1935	1,005	723	[a] 296
1939	1,133	803	[a] 330
REFINED			
1931		16	
1935	54	44	394
1939	95	70	348

[a] Estimated.

Source: Interstate Commerce Commission, *Statistics of Oil Pipe-Line Companies*, 1939.

[22] U. S. Bureau of Mines, *Survey of Crude Oil in Storage, 1936, 1937.*

Express Service

Those goods which demand fast service or special handling are usually transported in express cars on regular passenger trains. Express rate levels reflect the extra service provided. Although the express business originated with a number of independent concerns, it is now concentrated in the hands of the Railway Express Agency, which is owned by the principal railroads in proportion to the volume of their express business.

The volume of express traffic in the United States has shown a declining trend for nearly two decades. Express transportation revenue in 1923 exceeded $317,000,000 whereas in 1939 the corresponding figure was only $167,000,000. This shrinkage in earnings presumably reflects the vulnerability of express traffic to competition from other media. In 1923 more than 182,000,000 express shipments were handled by express companies. In 1939, despite vigorous advertising and solicitation, the number of shipments had only increased to about 140,000,000 from the low of 89,000,000 in 1933.[23]

Although express traffic is predominantly less than carload, in 1937 more than 12,000 carload shipments were made. These accounted for little more than 3 percent of the entire express revenue. Among the commodities moving in carload lots are fruits and vegetables, dairy products, fish, meat, horses, and cattle.

Freight Forwarding Services

Another type of service is offered by companies engaged in the consolidation of small lots of freight, the forwarding of these lots in larger shipments, and the distribution of the goods at the destination to individual consignees. The consolidated lots are forwarded by railroad, steamship, and motor carrier.

A variety of types of business enterprise are engaged in forwarding activities. Some serve groups of affiliated shippers such as associations of agricultural producers or dairymen's cooperatives. Some warehouse operators perform consolidating operations for manufacturers, producers, or distributors who use the warehouse facilities. Other companies perform these services for any shippers and consignees who ship or receive the types of goods which the forwarding or consolidating companies handle.

There are several varieties of forwarding companies. One type concentrates small lot export shipments in order to obtain the superior steamship service available to large lot shipments and to avoid the relatively high charges on small shipments. Arrangements are made for clearance of export shipments, insurance, and other necessary details. These companies often receive large lots of imported goods at United States ports, arrange

[23] These figures exclude Southeastern Express which was merged with the Railway Express Agency in 1938.

for clearance through customs, and forward the goods in smaller lots to individual consignees. A second type consolidates individual less-than-carload or less-than-truckload shipments into railroad containers or motor-truck load lots, in order to take advantage of the "mixture rules" of the railroad, steamship, or motor-carrier classifications or tariffs.[24] The forwarding companies receive payments from the shippers at the less-than-carload or less-than-truckload rates or less and pay to the carriers the carload or truckload rates. A third type, known as the fast freight or premium package forwarder, consolidates small less-than-carload or less-than-truckload lots of freight into large less-than-carload or less-than-truckload shipments so as to give the shippers the advantages of faster transportation, and collection and delivery services.

No complete data are available to show the total traffic of freight forwarding companies. Of the 20 freight forwarding companies engaged principally in domestic service, 13 are located in eastern territory, one in southern territory, and 6 in the territories west of the Mississippi River. The 1939 freight traffic statistics for Class I railroads show that freight forwarder traffic included in the carload shipments of manufactures and miscellaneous commodities comprised 230,461 carloads, or 2,796,906 tons of revenue freight originated. This traffic yielded the carriers $44,758,386 in revenue.

Compared with total carload traffic, freight forwarder traffic is small, but in comparison to railroad less-than-carload traffic the amount is significant, approximating 19 percent of the tonnage and 18 percent of the revenues from less-than-carload as is shown in table 38. These data indicate the importance of freight forwarder traffic by railroad, but are incomplete in that they do not show the forwarder less-than-carload traffic nor the forwarder traffic transported by steamships or motor carriers.

The Advent of the Private Operator

Since 1920 rapid development of hard-surfaced highways and improvement of inland waterways has made convenient transport facilities available to private individuals or companies which can supply rolling stock or floating equipment. Development of these facilities has promoted the growth of private operators (including the contract carriers owned or controlled by the shippers) so that their relationship to the common and contract carrier performing transportation for hire has become one of the most important and perplexing problems in the development of transportation policy.

[24] Such "mixture rules" are found in Rule 10 of the *Consolidated Freight Classification No. 14*, and in Rule 13 of the *National Motor Freight Classification No. 5*, and in the carriers' exceptions to these and other classifications.

TABLE 38.—*Revenue Freight Originated and Total Traffic Classified as Carload and Less-Than-Carload Railroad Traffic and Freight Forwarded Traffic, 1939*

Type of traffic	Revenue freight originated		Total freight traffic including duplications	
	Thousands of carloads	Thousands of tons	Thousands of carloads	Thousands of tons
Grand total rail carload	24,119	886,794	46,628	1,607,940
All less-than-carload freight	----------	14,875	----------	28,275
Freight forwarder traffic	230	2,797	415	5,054

Source: Compiled from *Freight Commodity Statistics*, Interstate Commerce Commission, Bureau o Statistics, statement No. 40,100, 1939.

In the 20 years following the passage of the Transportation Act of 1920 transportation conditions in the United States have radically changed. Improvements to highways have been made on a large scale at public expense. These facilities are used in common by private operators and by common and contract carriers. Neither the private operators nor carriers for hire are required to maintain individual permanent roadway or structures, as must the operators of rail or pipe-line facilities. The investment in vehicular equipment by private operators is roughly comparable to the equipment investment of motor carriers for hire; competitive conditions between them are, therefore, fairly equalized. Operators of motor vehicles, however, have a distinct advantage over the railroads since they need not assume the financial burden of large fixed investments in permanent structures. The capital risk of motor carrier operators is limited primarily to the relatively small unit investment in trucks. Under these circumstances there has been a very rapid development of private motor carriers in competition with all types of for-hire carriers. The use of the highways for intercity freight transportation by private operators and by carriers for hire is about equal. Intercity passenger transportation by private automobiles, however, greatly exceeds that by busses and other carriers of persons for hire.

Since 1920 the Government has spent more than half a billion dollars in developing the principal channels of the Mississippi River system to a 9-foot depth. These facilities can be used by any shipper furnishing his own floating equipment, without toll or tax to pay for maintenance and operation of the permanent structure or for capital charges on these structures. The large public investment in navigation facilities has likewise been used by private operators of coastwise and intercoastal vessels, particularly by oil, coal, and lumber companies.

These great private transportation systems have grown up in competition with common carrier systems because large shippers of freight found that they could perform the transportation service more economically or more efficiently than the common carriers, or because the common or contract rates on the commodities which they handled made carrier operation profitable in itself.

PART I—SECTION I
3. TRENDS IN THE TRANSPORTATION INDUSTRY

By Ernest W. Williams, Jr.[1]

Any attempt to forecast developments in the transportation industry faces a number of unknown factors. Prognostication must be based, in large measure, on present problems and the tools at present available, or in advanced stages of experimentation, to meet them. It should be noted at the outset that the tranport picture at any future period must be largely dependent upon Government regulatory, promotion, and taxation policies; technological and economic developments in the large traffic producing industries (particularly the fuel industries); population growth and shifts; and similar far-reaching adjustments in the economy. It is possible, however, to state certain possibilities on the basis of present and immediately prospective technological developments, providing certain assumptions are made regarding Government policy and economic change. Moreover, it is readily possible to suggest a number of desirable developments which are within the range of possibility and toward which suitable steps can be taken in the near future. Consideration will be confined mainly to common and contract carriage.

It appears feasible to effect a reduction of transport cost relative to prices in other fields if advantage is to be taken of the possibilities opened by technical developments in the transport industries, and if the operations of the various carriers can be confined to the types of business for which they are best adapted. As a result volume of transport may be somewhat stimulated if rate levels follow cost. However, declining population must place serious strictures on growth. With no tendency to rapid growth in volume, attention must be paid to adjustment of facilities and service to insure efficient movement. This gives some indication of the possible place of each mode of transport in the system within the next decade or so. The dominant role of the railroad in internal heavy freight movement, supplemented by pipe lines and, to a limited extent by waterways, is evident. The more valuable freight adjusts itself to railroad movement on the longer hauls, and to the truck on short hauls, the dividing point depending largely upon terminal conditions and terminal costs, and density of traffic available. No arbitrary limits can be set, either as to type of traffic or length of haul. Merchandise business appears ill adapted to rail haulage, except in the middle distance field if service can be rearranged, and may gravitate largely to air and motor carriers. In the light density areas and on branch routes the railroad has serious disabilities, and motor carrier operations may be substituted in large measure. In the passenger business the trend to air travel on the long routes may be accelerated, with the bus securing much of the short-haul business. The railroad appears to have a field in commutation, overnight sleeping car, and long daylight operations where service can be given superior to that available by bus.

The Need for Economy of Cost

Since the last war transportation costs have shown large increases which have been, for the most part, reflected in horizontal rate increases. Even during the depression years the tendency of the railroads was to seek increases in an effort to offset the declines in net income which were produced by rapid reduction in traffic volume. Despite two general rate increases since 1930, the tendency has been for average rail revenue per ton-mile to decline slowly as a result of reductions in specific rates to meet competition and to encourage movement of certain types of traffic, and as a result of shifts in the composition of traffic and a lengthening of the average haul. Nevertheless, there is considerable reason to suppose that transportation has been discouraged by a rate structure which fails to respond quickly to changes in economic conditions and a rate level which may be out of line with the market possibilities of many commodities. Concern is being shown in some quarters that a more or less permanent reduction in total traffic volume may result.[2]

In view of the rapid expansion of many types of transport facilities in recent years, any reduction in total traffic available under present rate structures must be viewed with some alarm by the various transport agencies. The railroads, particularly, have been suffering acutely from lack of traffic and the temporary growth incident to the defense effort cannot be considered a permanent solution of the difficulty. While considerable traffic has undoubtedly been lost by the railroads to other forms of carriage, it also appears that much traffic may have been lost as a result of technological change in the power industries, including increas-

[1] Economist, National Resources Planning Board.

[2] See, for example, S. R. Trnesdell, "Basic Factors in the Plight of the Railroads," 8 *Civil Engineering*, 804–807.

ing efficiency in fuel consumption, and as a result of relocation of industry and other related factors. Developments of this sort destroy traffic of the type for which railroads are particularly suited. From the point of view of the carriers it would seem essential to make every effort at reducing the cost of carriage and reflecting this reduction in the rate structure. Many developments of a type calculated to reduce or eliminate transportation may appear profitable at the present rate level, but may be viewed in an entirely different light when the cost of carriage is reduced.

Entirely aside from the possible effects of a decline in traffic upon the prosperity of the transport system, it is clearly evident that national policy must concern itself with securing the most economical transportation service possible by whatever means, or combination of means, best fits each class of traffic. Only such a transport policy is consistent with the ideal of promoting the most efficient economy within the Nation, an economy which will produce at lowest cost and in sufficient quantity the goods and services desired by the population.

Moreover, in the present period of emergency, special attention must be given to the requirements of post-war conditions. Regardless of the outcome of the present struggle, we may expect to face a world in which productive capacity for many types of industrial goods has outstripped the demands of the several national economies, a world in which the abundant labor of poverty-stricken nations can be expected to be used on a low-wage basis in production, and a world which must seek markets for its goods outside the producing countries.[3] Moreover, it is probable that we shall face a world that is much poorer than it has been for many generations, and that foreign countries will not be able to pay the accustomed prices for raw materials.[4] Consequently, reductions in transport costs must be considered highly desirable to strengthen the competitive position of American producers in the world market, and to promote expansion of domestic consumption.

Since transport cost in the aggregate embraces a considerable portion of the delivered cost of a majority of commodities, success in reducing commodity prices must depend in considerable measure upon greater transportation efficiency which reflects itself in a declining rate level. The need for economy of transport cost is obvious. A little investigation discloses that a variety of means are ready at hand and await only the clearing away of certain obstacles, the clarification and unification of policy, and in some cases further refinements of techniques and design.

[3] See report of Committee on Co-Operative Relations with Universities, 42d A. R. E. A. Convention.

[4] Beatty, E. W., "Year End Statement" quoted in 110 *Railway Age*, 49 (1941).

Causes of Excessive Transport Cost

The most notable opportunities for transport economy arise from the fact that each mode of transport is trying to compete for business which other types of carrier could handle more economically. Undoubtedly a substantial part of this business is handled at a loss, but the difficulty of securing accurate cost figures applicable to any particular class of traffic precludes the possibility of making a decisive showing. On the railroads, however, it is clearly evident that much of the less-than-carload business is handled at substantial loss to the carriers. The unprofitable nature of this traffic was admitted by railway officials early in the present century, but the case for the L. C. L. service has become progressively more dubious since that time. Not only have the costs been increased by the necessity of faster service and the provision of pick-up and delivery service, but the traffic has been greatly diluted by the inroads of motor competitors, forwarders, and other types of carrier. In consequence, the unit losses have doubtless increased. Much of the railroad passenger business falls in the same class.

At the same time many other carriers have been expanding into business which they are probably handling at less than full costs. Again the difficulty of accurate allocation makes a clear showing impossible, but there is strong ground for supposing, and it is admitted by some motor carriers, that extension of common carriers into the long-haul field is subject to serious cost limitations. Certainly it is evident from recent cases before the Interstate Commerce Commission, that motor carriers are handling much traffic which could move more economically by rail if rates were adjusted to reflect the cost of rail operations. This has been especially true of long-haul and bulk-freight operations.

The multiplication of overlapping services in fields of doubtful economy must, in the aggregate, account for a considerable inflation of transport cost above what would be possible from a more economic division of the traffic. The declaration of policy in the Transportation Act of 1940, taken in connection with the announced obligations of the Board of Research which the act establishes, appears to indicate that increasing attention will be given to this problem. Moreover, an increasing number of rate cases before the Interstate Commerce Commission opens the possibility of gradual adjustment through the channel of rate relationships. Estimates of economies which might result from the elimination of services which now operate at a loss are, of course, impossible, but it seems reasonably clear that they would be substantial.

It must also be recognized that, in addition to economies that may be expected from better utilization within

the existing transport framework, changes in the framework itself may be expected to aid in economizing transport cost. For example, the light-traffic branch lines and the numerous competitive feeders of railroad companies often have little excuse for further existence. No possibilities exist for making them profitable in operation. Where branches come in this category they should be, and probably will be, abandoned. Railroads must be permitted to substitute their own highway service, however, lest they lose the main-line haul on business which can profitably move by rail for a part of its route. Otherwise, many branch lines, unprofitable in themselves, will be continued in operation as feeders.

Development of Railroad Technology

Although public attention has been focused principally upon the outstanding technological developments in the newer types of transport, important advances have been made on the railroads which hold out the possibility of continuing improvements in service and increased economy in operation. Outstanding among these have been developments in motive power which are only beginning to find application.

Locomotives

Despite the restricted market for locomotives which characterized the depression years, research went forward and many refinements were developed. Higher pressures were utilized, many new auxiliaries developed, cast steel locomotive beds came into general use, and new efficiencies were realized. Simultaneously, the demands of competition and of an economy that was beginning to depend upon swift transport to replace inventories, necessitated a general speed-up of road freight service. Modern locomotives were designed to meet the new requirements and the high-wheeled, big-boilered freight engine for high-speed work featured most of the meager orders for locomotives. The middle thirties marked the advent of an essentially new type of locomotive with great possibilities, the single expansion articulated locomotive for high-speed work.

The effects of these recent developments have only begun to be felt. The locomotive inventory has become progressively more aged because of the small purchases of recent years. Sufficient new locomotives have, however, been placed in service to demonstrate the excellent possibilities for economy under certain types of conditions. New locomotives are showing directly calculable savings ranging from 10 to 20 percent per annum on the investment, although locomotive prices continue high and orders are, for the most part, small.[5] The savings proceed from: (1) the more intensive utilization that is possible from the modern steam locomotive; (2) the greatly reduced maintenance costs on new power arising from outstanding developments in design; (3) greatly reduced fuel consumption; and (4) greater hauling capacity at high speeds.[6]

In practice, many considerations which must enter into a decision to choose new motive power will effect the ultimate economies resulting from its use. Capacity of bridges, weight of rail, curvature, and similar items must be considered. The use of heavier power frequently requires substantial rebuilding of way and structures. Moreover, the capacity of the shops to deal with the new equipment must be considered, enginehouse stalls and turntables lengthened, and water columns of greater capacity installed. Hence it is only when sufficient traffic is available to insure good utilization that the large modern locomotive will produce the indicated economies. Substantial improvement elsewhere is, however, possible from the modernization of existing power.

Economies are particularly evident wherever frequent heavy trains can be made up for long, uninterrupted runs. On light-traffic lines, however, considerable possibilities also are available. The general policy in the United States has been to employ on branch and secondary lines the older and lighter locomotives formerly used upon main lines. To a considerable degree this is necessary and economical for working out the late years of a unit's economic life. However, much of this power is patently ill-adapted to the requirements of light-traffic lines, and suitably designed modern units of light capacity should demonstrate the possibilities of better service at substantial economy. In this field Diesel and gasoline powered units seem to have great possibilities.

In late years many roads have placed in service Diesel-electric switching locomotives which enable substantial economies in fuel, servicing, and maintenance expenses; achieve a higher degree of availability than equivalent steam power, and have a flexibility in operation that permits more rapid accomplishment of many types of switching work. To a large extent, standard designs have been developed by the various builders, each of which is used on a number of roads. This

[5] Indeed, a purchase of heavy steam-passenger locomotives replacing power purchased in 1922 is reported to have produced net annual savings of 50.21 percent in directly calculable operating and maintenance expenses on the Union Pacific. These large savings resulted primarily from the peculiarities of the service which enabled substantial reductions in both train mileage and double heading.

[6] On the Norfolk & Western, for example, fuel consumption has declined from 147 pounds per 1,000 gross ton-miles in 1925 to 89 pounds in 1940. Meanwhile, repair costs of steam locomotives per million tractive-force pound-miles have decreased from $7.35 to $4.99. On the Southern Pacific fuel consumption declined in the same period from 133 to 97.7 pounds. The cost of repairs per 1,000 pounds tractive-force miles declined from $1.22 in 1920 to $0.63 in 1940. 111 *Railway Age* 26–28, 1941.

points to the eventual possibility of mass production of locomotives for switching and light branch and local main-line services.

As yet, the use of Diesel power has scarcely made a dent in the extensive switching operations of the carriers, but the number of units in service is rapidly increasing and, in passenger yard operations, about one-fifth of the yard engine service hours were performed by Diesels in the first 10 months of 1940.[7] The Diesel locomotive has not yet proved its economy for freight and passenger road service, except in a few limited fields. It may be expected, however, that the Diesel will preempt most of the long fast runs,[8] and that it may prove very useful in local service requiring frequent stops wherever sufficient utilization can be secured. Early developments may sufficiently reduce the first cost of Diesel power to permit its economical use over a much wider sphere of service. Indeed, during the past year, the prices of Diesel locomotives have been placed on a much more favorable comparative basis than hitherto, but partly because of rising prices of steam power.[9] Meanwhile, further refinements of steam locomotive design may be expected, and whatever type of power eventually proves to be best adapted to the various services, substantial economies in operating cost may be anticipated.

Car Equipment

Despite the increase in average car capacity in the last two decades, car performance has been discouraging. The proportion of deadweight to revenue freight carried has increased substantially. Recent developments in car construction, including the use of various lightweight materials and new methods of assembly, point to the possibility of materially reducing the tare weight of cars of a given capacity.[10] Moreover the use of these types of construction enables increases in the weight-carrying capacity of cars. Fortunately, the cost of lightweight cars has been rapidly reduced and, when substantial orders materialize, will undoubtedly be no higher than the cost of construction of conventional cars. Significant economies may result from better train and car loading. It is pertinent to note, however, that the seasonal pattern of traffic permits full utilization of only a portion of the rolling stock.

[7] I. C. C. Bureau of Statistics, Statement No. M–215, October 1940.

[8] Few experiments have as yet been made in freight service, but the Diesel would seem to offer advantages over steam power in through fast-freight service on runs which will enable a large daily mileage from each locomotive unit. Recent orders for Diesel road-freight locomotives, mostly of 5,400 hp., indicate the expectation of the carriers that better and more economical service may be afforded by Diesel power.

[9] 110 *Railway Age* 76 (1941).

[10] Reductions in tare weight of as much as 30 percent have been achieved.

Yard and Line Improvements

Closely related to motive power and cars in operation are the characteristics of the lines over which transportation is performed. In earlier years large economies resulted from heavy investments in grade reduction and improvement of alignment, intermediate yards, and other facilities. Quite naturally the depression halted this type of improvement, and permanent declines in traffic may render many projects uneconomical.[11] Important opportunities are, however, available for the fuller utilization of existing low-grade lines. Some use of this sort has been made on a cooperative basis, but widespread improvement must apparently await the accomplishment of consolidation on a broad scale. The requirements of speed in modern transport service have necessitated important adjustments in schedules and operating methods. Wherever possible, freight trains are now run past intermediate yards for long distances, and classification is concentrated at strategic points. This adjustment, in addition to changes in traffic volume and characteristics, has altered the distribution of yard service loads. Many yards have been substantially abandoned, while others have increased in importance.

The economies resulting from classification along this system may be substantial, but best results are realized when the work is accomplished in modern yards, well laid out and adapted to traffic needs. Hump yards equipped with power switches, car retarders, and other devices show great economies where sufficient traffic is available for steady operation. Many opportunities for economy through the modernization of these large yards are available,[12] but it must be remembered that they constitute a small portion of the total. It may be that an even greater source of economy will be found in remaking the many smaller yards to serve better the new requirements. Rearrangement of trackage, switching leads, and grades may often be accomplished at small cost to effect improvements in operation.

Movements over the road have been considerably expedited by modern signal devices, telephone dispatching, centralized traffic control, and modern interlocking machines. The use of multiple aspect signaling and cab signals enables trains to keep on the move at maximum safe speeds, alleviating many delays that resulted from the older methods. Centralized traffic control installa-

[11] In 1932, however, the Delaware and Hudson published the results of exhaustive surveys on the possibilities of grade reduction and estimated annual savings up to 11.1 percent on the required investment. See "Conditions—Delaware and Hudson Railroad," address of L. F. Loree, September 1932.

[12] On 16 car-retarder installations an average annual saving of 26 cents per car handled was effected, and the average annual return on investment was 42.8 percent.

tions have been particularly valuable as a means of reducing expenses and getting trains over the road. In many instances the use of this type of equipment has enabled a single-track line to do the work of a double track.

Maintenance

Transportation expenses represent only a part of the operating expenses of the railroads. The other important categories are maintenance of way and maintenance of equipment. We have already pointed out that substantial economies in the latter field may result from the adoption of modern rolling stock. The modernization of shop equipment and facilities at the more important terminals and repair points also presents possibilities. The rapid extension of locomotive runs has rendered many engine terminals obsolete, and both heavy and running repairs are being concentrated at principal points. This simplifies the problem of modernizing shop facilities, but as yet little has been done. The majority of railroad shops were designed and equipped at least two decades ago. In the meantime, locomotives have grown larger and heavier and the character of the work is somewhat altered. Large economies are available from the introduction of new equipment at the larger repair points, where good utilization for specialized machinery can be obtained. Further rearrangement of engine assignments may permit enhanced concentration of heavy work at those facilities best equipped to handle it.[13]

Commendable progress has been made in maintenance-of-way work in recent years. The rapid introduction of treated ties and heavy rails, the use of new techniques for building up rail ends, the rapid adoption of mechanized equipment, and the organization of system rail-laying gangs are indicative of the type of development that is under way. Particular emphasis has been placed upon mobile equipment which is not confined to the rails and hence offers minimum interference to traffic.[14] Unfortunately, the carriers have not found it possible to adopt these methods on a universal scale. This is particularly true of routine track work. Many roads continue to employ very ancient equipment in rail-laying operations, to do large amounts of ballast cleaning by hand, and to handle tie renewals, surfacing, and tamping with small section gangs without power equipment. Here additional opportunities are available. Moreover, the effects of increased use of heavier rail sections and of treated ties will continue to be felt in reduced renewal requirements.

The most significant recent advance in permanent way has been the development of the welded rail. Early experience on the Bessemer & Lake Erie and on the Delaware and Hudson with continuous welded rail in lengths as great as one mile appear highly successful. The elimination of rail joints through welding avoids end batter and greatly reduces maintenance costs. The railroads have been slow, however, to adopt continuous welded rail because it marks a sharp break with conventional practice. Test sections are in use on several additional roads, and more extended application may be expected.

Subgrade drainage has always been a serious problem, as heavy traffic over sections of the line where drainage is poor brings continuous difficulty for track forces attempting to keep the track in line. Better drainage through the use of systems of perforated pipe has been found useful in many situations, but the development of greatest promise appears to be the concrete slab under ballast, which distributes the load more evenly and preserves track alignment. A number of installations of this sort have been placed in service in recent years.

Terminal Improvements

These economies are available to individual roads without cooperative measures. The important possibilities which might be expected to proceed from extensive coordination and consolidation have been exhaustively explored and estimated on many occasions.[15] Although the accuracy of the estimates is not convincing, there can be no question of the magnitude of the savings involved. However, extensive developments in this direction require a high degree of cooperative planning and extended negotiations for the equitable treatment of the various special interests involved. Extensive consolidation along the most efficient lines probably will not be effected except as a result of Government participation in the planning and in the consummation of the adjustment.[16]

However, important economies can be effected under the present system of operation by cooperative action of the carriers. Terminal unification may be expected to proceed, though at a slow pace, when economies which are available are estimated with sufficient definiteness, and adequate safeguards for the interests of individual carriers are devised. Duplication of facilities and services within terminals, cumbersome and costly interchange methods, circuitous hauling in terminal areas, and other inefficient practices can be largely revised by cooperative action. Unfortunately, there are serious

[13] The Florida East Coast reports notable success in this direction.

[14] And, incidentally, does not require train crews.

[15] See part I, section IV, 2 of this report.

[16] In the past, consolidations have largely been motivated by strategic and traffic considerations rather than by the desire to promote the maximum efficiency in transportation. See, for example, Grodinsky, Julius. *Railroad Consolidation.*

difficulties in the way of securing such action, and external stimulus often seems essential.

Great improvements in service to the public, better utilization of land and air rights in large urban centers, and the removal of many existing blighted areas would result from the substantial reconstruction of terminal facilities. The objective would be, of course, to fit into the most desirable pattern of urban development a series of coordinated terminals serving all types of transport and open on equal terms to all carriers serving the area.

Terminals planned to meet the requirements of developed centers would replace the multiplicity of scattered facilities which have grown in and around most of our large cities in a more or less haphazard fashion. These terminals would handle rail, motor, water, and air transport within the framework of a single plan in order to eliminate much of the wasteful transfer and hauling which occurs under existing arrangements and to avoid the marked loss of time which results from the use of scattered facilities under diverse ownership. They would be connected with all parts of the urban area to be served by belt rail lines and trucking facilities.

An approach to such arrangements has been secured in St. Louis by use of the Terminal Railroad Association. Intercity motor carriers, water lines, and air facilities are not included, however. Nonetheless, the advantages of the system are readily apparent, despite the fact that much use was necessarily made of existing facilities which proved difficult to integrate into the whole.

Substantial obstacles stand in the way of the type of terminal development suggested here. The interests of individual carriers are often best served by existing facilities. Local drayage and other interests which stand to lose by more efficient arrangement may erect formidable opposition. Finally, much new investment would be required for the construction of the most efficient coordinated facilities. It is clear that if such developments are undertaken in the near future on the broad scale that seems most desirable from the public viewpoint, they must be done by government. Construction and ownership of terminals by government units is not incompatible with privately owned and operated line-haul facilities, and privately operated terminals. All facilities must, however, be open on equal terms to all carriers entering the terminal area.

Line-Haul Services

The economy of the Nation suffers considerably from uneconomical line-haul as well as terminal operations. Parallel facilities erected for competitive service frequently provide much excess capacity, while parallel train schedules are operated between many points by a number of competing roads, despite a lack of sufficient business to enable economical loading. Moreover, the universal maintenance of the open gateway and the shippers' privilege of routing traffic, together with fairly liberal use of Fourth Section relief to enable circuitous routes to share in through business, produces much waste in transportation. The average rail carload moves about 11 percent farther than would be necessary were a direct-line route in common use employed for the movement.[17] Wastes of this sort are not easily eliminated save by outright consolidation on a plan directed toward the accomplishment of maximum economies in operation.

In revising the less-than-carload and merchandise business and placing it on a profitable basis cooperative action is essential not only among railroads but also between rail and motor carriers. If this type of business is to be held to the rails on the long hauls, the cost of transport must be greatly reduced and the service materially improved. Merchandise traffic in the short distance field is definitely unprofitable to the rail carrier at competitive rates, and may be expected to move more economically by motortruck. On the longer hauls, however, the railroads may hope to share in merchandise traffic providing suitable adjustments in service and rates are forthcoming. The train is a poor unit for moving this type of traffic, since the average car provides much more capacity than is needed and also a high ratio of tare weight to revenue load. The business requires frequent and rapid service, but cannot readily be concentrated for movement in large units. The present organization comprising pick-up and delivery service to and from rail freight stations, loading in ordinary box cars, and transfer of lading at one or more intermediate transfer houses until enough freight is gathered to load a full package car results in very low average carloads and excessive terminal and handling costs. Much merchandise moves via express and parcel-post services, and large quantities of merchandise and less-than-carload shipments are at present concentrated and dispatched by freight forwarders.

The duplication of Nation-wide services for this type of traffic, when considered in connection with the uneconomical methods used in handling the business, indicates considerable waste in this transportation. Many methods are available, however, for improving the service and materially reducing its cost. The major items of expense are encountered in terminal and transfer operations and in the attempt to assemble sufficient tonnage to utilize standard railway equipment efficiently. On comparatively short hauls most of these difficulties

[17] Turney, John R., "The Price of Open Gateways," 187 *Annals of the American Academy of Political and Social Science* 25.

are minimized by utilizing motortruck service for the complete haul. On long hauls, however, advantage may be taken of low railway line-haul costs in conjunction with a revision of terminal and concentration methods.[18]

Some railroads have already made substantial progress in adapting their less-than-carload services to the needs of the traffic. The use of the zone system, under which tonnage is brought to on-line concentration points by an extensive network of motor lines which perform pick-up work and replace local freight trains in gathering freight from way stations along the lines, enables concentration of a considerable volume of freight at the zone station, permitting the loading of through cars to more important stations and, to that extent, eliminating transfers en route. In connection with this type of operation the container is very useful. At least one large railroad has adopted it extensively in less-than-carload freight service since it is possible to load a single container between many stations where insufficient traffic exists for a through car. Moreover, transfer of containers from car to car can be economically accomplished by gantry crane.

The container and such similar arrangements as the demountable car body, the Portakold or refrigerated container, and the transportation of conventional semi-trailers by flat car, offer great possibilities for economizing terminal cost and speeding service. In addition, they greatly enhance the flexibility of operation and permit considerable relaxation of packing requirements. In effect the use of the container enables the employment of the motor truck in the terminal service for which it is so admirably fitted, while retaining the train as the unit for line-haul operations. It does not, however, offer a means for competing on the short hauls.

Although many branch lines carry so little traffic as to require early abandonment, others contribute enough to main-line revenues to permit their continued operation providing economies can be effected. Numerous types of light motive power and self-propelled units have been developed for branch line work which should enable a low cost service more in keeping with the needs. Where the substitution of such service will not enable the restoration of profitable operations, branches will likely be abandoned and substitute highway service offered.

Deterrents to Rapid Progress

Before proceeding to mention changes which may be expected in other fields of transport, it may be instructive to explore some of the factors which are, or may be expected to become, influential in delaying the possible developments in the railroad industry. During the early years of the depression difficulties in the way of financing improvements were undoubtedly of importance in delaying the purchase of modern power and maintenance equipment. In the face of acute financial difficulties it must have appeared undesirable to the managements of many companies to increase their outstanding debt. The availability of large reserves of stored equipment and the possibility of handling a large portion of the business with the most modern units removed most of the incentives for such development.

At present, however, conditions seem favorable for considerable expansion in equipment purchases if construction capacity can be found. The problem of financing is no longer a salient one, since equipment trust money appears to be readily available at low rates of interest. Moreover, considerable purchases of equipment are patently needed to insure adequate capacity and to arrest the continuing obsolescence of the railroad plant. Aside from the possibility of difficulty in securing deliveries, high equipment prices and the uncertainty regarding future developments are the major deterrents at the present time. The possibility that further uncertainties may be introduced into the situation by the reappearance in the Congress of such proposals as the limiting of train lengths, makes it utterly impossible to predict what size and type of equipment should be acquired in order to effect maximum economy.[19]

Important changes in alignment and in yard and terminal facilities have, of course, been difficult to finance. However, a more serious deterrent has been the widely fluctuating volume of traffic which made estimates of needs and of possible economies extremely difficult. The higher levels of traffic obtaining in recent years, coupled with good prospects for the immediate future, may be expected to influence more rapid developments in modernizing this group of facilities.

The large economies which should proceed from terminal unification and consolidation under private auspices may not be looked for in the near future. The obstacles to large-scale developments of this sort proceed from the independent and competitive attitude of the carriers and their solicitude for existing "strategic advantages," the opposition of labor groups, the fears of shipper groups and of communities likely to be affected, and the lack of any definite and obviously superior plan for consolidation. Moreover, any read-

[18] It appears that all-truck movement to points up to 400 miles distant from the shipper may be more economical than rail service, but this relationship may change with developments in equipment and methods.

[19] It is perhaps needless to point out here that substantial increases in operating cost would result from such a proposal and that it would be entirely inconsistent with the objective of maximum economy of transport cost, particularly in the important field of bulk commodity transport. Recent gains in locomotive capacity might be expected to be almost entirely nullified and the large investment in facilities for utilizing those gains rendered unproductive.

justment of the present rail plant for consolidated operation would require heavy investment in new facilities to provide for a changed flow of traffic. Lesser measures of coordination, such as the adoption of containers in merchandise services, may be expected to proceed slowly if current difficulties can be overcome. Maximum results can only be secured through the interchange of equipment and operation under joint rates. The development of numerous types of equipment, few of which are interchangeable with other types, conflicting patents, and the difficulties of agreeing on tariff provisions seem to be the outstanding deterrents. The problem of financing can doubtless be overcome.

The light traffic branch line has for many years sapped the vitality of the carriers. Nevertheless, little progress has been made toward lessening this drain upon carrier revenues, although abandonments have been proceeding at an accelerating pace. The principal obstacle in the way of adjusting branch-line services to traffic needs is the inflexibility of working rules and wage agreements, supplemented by full-crew laws in certain of the States. Traffic on most branch lines is not sufficient to permit the operation of large train units, and the attempt to use this type of unit with the usual crew prohibits the rendering of an effective, frequent service designed to secure and hold traffic. Unless the new types of light units, with crews to match, can be operated under suitable working rules, a large proportion of branch-line mileage must be completely abandoned. Indeed, a considerable portion of the branch lines has so little traffic as to render any experiment designed to keep it in operation unwarranted.

Motor Carriers

The last two decades have witnessed a phenomenal growth of motor-carrier operations, both for common-carrier service and for private use. Nation-wide truck and bus services are now available, and an increasing proportion of freight and passenger traffic seems to be gravitating to the highways. Recent developments may be expected to continue the progress which has enabled the motor carrier to capture a significant place in our transport picture. They include the improvement and widespread adoption of the Diesel truck and bus, with attendant economies in operation, particularly of fuel costs. Concomitantly, the gasoline produced for propelling vehicles of the conventional type is being rapidly improved. Engine design will undoubtedly reflect the full advantages to be derived from these improvements, and substantially enhanced performance may be expected, accompanied by reduced operating costs.[20] Moreover, an extension of the use of light-weight materials for truck and trailer bodies may reduce tare weight and increase the pay load which can be handled in a truck or combination of given dimensions. This development on a widespread basis may portend considerable economies of haulage cost.

Developments in freight haulage by motor truck depend, in considerable measure, upon public policy with respect to sizes and weights of motor vehicles. It seems reasonable to expect a trend toward uniformity in State regulations, with attendant economies to the long-haul operator who may find frequent readjustments of pay load unnecessary in the future. However, it seems unlikely at the present that a substantial change of these restrictions in the direction of liberality can be expected in the near future since the highways must continue to be chiefly preempted by the private automobile whose convenience and safety must be considered. Consequently underpowering must be corrected and separation arranged wherever possible.

Between important traffic centers it is not at all impossible that express truck highways may be constructed, perhaps as toll roads. On such highways restrictions on length, width, height, and weight might be much more liberal. Trucks of much larger capacity can be constructed and, if confined to highways of this type, used in common-carrier service, but the limited radius of action for such vehicles would impose a practical limitation. It would appear that unit freight-handling costs would decline materially with important increases in truck capacity, since a large portion of operating cost varies with miles run and time on the road, rather than with amount of pay load. Substantial reductions in ton-mile cost should enable truck operators to bid for considerable traffic which they are now unable to handle economically.

Bus transportation promises to become more and more attractive to the public, particularly on the longer hauls. The recent advent of air-conditioning in the bus field, coupled with the introduction of new and greatly improved coaches, marks the approach of new standards of comfort for bus passengers. Likewise, terminal and rest-stop facilities are being continually improved. Moreover, continued mechanical developments have resulted in reduced maintenance expenses and greater utilization of bus equipment. Rapid obsolescence, of course, presents something of a problem, and the additional weight incident to air conditioning may exert something of the same influence on power requirements as on the railways. As in the trucking industry, the Diesel power plant is being rapidly adopted and gives promise of considerable reductions in operating costs.[21]

[20] See 19 Bus Transportation 606 for a full discussion.

[21] Burlington Transportation Co. has acquired considerable experience with Diesel busses on transcontinental runs and reports fuel savings as high as 30 percent.

Development of bus operations is, of course, largely dependent on the various steps which the railroads may take to meet competition.

Water Carriers

Recent years have witnessed rapid advances in the efficiency of operations by water carriers, both in the coasting services and on the inland waterways. Much of the tonnage in the coastal and intercoastal fleets is of obsolete construction, costly to operate and maintain. New vessels are appearing on some of the services, however, particularly tankers. The new tankers are of large size and all very fast, but at the same time economical. In a little more than a year the United States will have the most modern sea going tank ship fleet in the world, averaging but 10 years per vessel. Two hundred such craft are now under construction or on order. The development of electric couplings for Diesel power looks quite promising for vessels of moderate size and may, indeed, develop much farther. Modern construction with the latest propelling machinery, whether steam or Diesel, enables substantial economies in operation. The new standard designs of the United States Maritime Commission, intended principally for the foreign trade, are indicating new possibilities in the direction of high speed and cubic capacity with economy of operation.[22]

The all-important terminal operations, however, require speeding up and modernization. Terminal expenses absorb a large portion of the water carriers' revenues and, as a large portion of vessel expense continues while ships are in port, speed is essential in cargo handling. Moreover, the increasing cost of labor, particularly in general cargo services, is making port operations difficult to support in the coasting trade. Mechanical equipment is available, both on ship and shore, for handling bulk and general cargoes on an economical basis, but little progress has been made in installing such facilities for handling general cargo. In some instances union contracts have forbidden the use of self-propelled trucks and other mechanical equipment in the package trade. In order to continue the general cargo coasting services in operation, however, recourse must be had to mechanical equipment at the ports. For coastwise work and for some of the Cuban trade, vessels of the Seatrain type offer substantial promise. These vessels are, in effect, car ferries in which loaded freight cars are stowed by electrical elevating machinery. The costs of breaking bulk and cargo handling are thus practically eliminated, and a rather economical operation secured.

[22] New freighters for the India services of American Export lines have averaged 16 knots and over with full load at a fuel consumption as low as 0.65 barrel per mile.

On the inland waterways barges and towboats of recent construction show drastic changes from earlier craft. Improved hulls are streamlined to reduce resistance and enable increased speed with the same power. Electrically welded steel construction reduces weight and permits greater cargo capacity. Double screws have been adopted for modern towboats, providing greater maneuverability and greater speed with the same power. The Kort nozzle is said to increase propeller efficiency by 30 percent and also increases the effectiveness of the rudders. The Diesel engine effects fuel economies, increases cruising range, and enables the use of smaller screws. As these newer types of barges and towboats are more generally adopted extensive reductions in operating expense may be looked for.

The Great Lakes are securing some new bulk-freight carriers, principally ore boats. They will be of great size and economically powered. Increasing use is being made, also, of the self-unloading bulk freighter and collier, both in the Great Lakes and coastwise trades. The vessels have a flexibility and independence of port handling facilities hitherto unequalled in the bulk trades.

Air Transport

Technical advance has been particularly rapid in the field of air transport, where, perhaps, the greatest potentialities exist for further development. Larger and more speedy transport planes have been placed on the market at frequent intervals. Operating costs per plane-mile have consequently increased, but calculations on a ton-mile basis indicate rapidly decreasing operating costs. This tendency may be expected to continue in the future. It may be that ton-mile costs of airplane operation will be reduced to 6 cents or thereabouts, enabling a strong bid for much traffic now moving by rail or highway. This cost figure is not an inclusive one, since it relates only to plane operations. It is useful, however, to compare current rates by other types of transport. Railway express rates now average in the neighborhood of 15 cents per ton-mile, and much truck and rail less-than-carload freight moves at rates higher than 6 cents. Recent development of larger planes, coupled with great expansion of productive facilities, seems to promise the advent of economical cargo planes in the near future.

One of the most important problems facing commercial air transport is that of access to airports, especially in large cities. Since one of the important advantages of the plane is its speed, time lost in ground transportation at both ends of the run is a serious drag. This problem may be partly solved through the use of the autogiro in shuttle service to downtown terminals.

This type of plane is not being actively pushed at present but would seem to offer important possibilities, given further technical advance.

The Army is already developing an efficient transport service using designs of cargo planes developed from standard commercial air liners. The air line companies are watching these developments with interest, and are preparing the ground for commercial cargo services to be begun after the war. A promising new direction for plane development is opened by the recent experiments with the flying wing both here and abroad. Considerable improvement in performance is indicated for large planes of this type, with accompanying reductions in operating cost. Under the stimulus of wartime needs this experimentation may move ahead rapidly. The use of higher octane fuels is a possibility for the near future and, as motors grow beyond 2,000 h. p., it is probable that the Diesel will again come in for consideration because of its economy.

At present all commercial developments are strictly curtailed by the needs of the military, but after the war present productive capacity must seek outlets in the commercial and private air transport fields. Reductions in first cost that will greatly reduce fixed charges may be confidently expected, as well as rapid expansion in economical air operation. The big problem will be one of providing adequate landing fields to accommodate the increasing business.

Future Trends

This rapid survey of possible technical advances in the various transport fields leads to various speculations regarding the transportation system in the next decade. It may be stated with a degree of certainty that the rail network will continue to contract as a result of abandonment of unprofitable branch lines and duplicate mileage, but the remaining system will be coordinated and modernized to function better in its particular field of activity.

Position of the Railways

The railway is peculiarly adapted to the carriage of goods in large quantities between important points. Wherever a sufficient volume of traffic can be developed to permit economical train loading and a reasonable density of traffic, the railway can move the business more economically than any other type of inland transport. Actual performance falls far short of the possibilities, largely because of a failure to adapt railway operations to the types of work for which this species of carrier is best suited.

Railways, primarily designed for and capable of moving heavy tonnages at high speeds, are, to a considerable extent, absorbed in the performance of services which probably can be more economically performed by other types of transport agency.[23] Moreover, the carriers have made little effort until very recently to adjust their rate policies toward a recognition of the fact that the basic field of rail transport is in mass transportation. Its future lies in its continuance as the principal agency for internal heavy-freight movement.

In this field the railway need fear no competition in the near future if advantage is taken of all the possibilities. The railways are capable, under a system of train-load operation and rates, of meeting most inland waterway competition except over the Great Lakes system. Other than waterways and pipe lines, no agency of transport can seriously challenge them save on the shortest hauls. For the movement of bulk commodities, e. g., coal, grain, lumber, and ore, over long distances the rail carriers must expect to continue to dominate the transport picture. They may be faced, however, with important technological advances tending to restrict the volume of their bulk business, such as long distance electric transmission and the liquefaction of coal.

Adjustments in operating practices and rate structures must be accomplished in order to obtain the maximum economy in tonnage operation and to make this economy fully apparent to shippers. Where necessary to meet bulk haulage in cargo lots by waterway or pipe line, the railroads can investigate the possibility of trainload rates. Several examples of such rates have already been published, including one on blackstrap molasses, to meet water competition.

The largest segment of rail traffic is suited to carload operations. Where terminal operations are not too complex this business may best move by rail even over very short distances. However, terminal operations involving circuitous car movement and similar expensive expedients lengthen the distance at which the railroad begins to have an advantage in the carload traffic. An important qualification must also be made for the large body of high-class goods requiring speed in transit. The studies of the Federal Coordinator indicated a substantial advantage for trucks in speed of service, even over fairly long distances. Where rates can be maintained by motortruck operators at or near rail rates, this faster service gives them a significant advantage on high-speed traffic. As indicated earlier, the rail carriers have made rapid progress in speeding up their operations, and the advent of scheduled freight trains providing first morning delivery over distances as great as 550 miles indicates the possibility of holding much of this business.

With certain improvements in methods and service, the railroads may continue to haul the bulk of the long-distance perishable traffic. The hauls from points on the west coast to points in Central Freight Associa-

[23] Smith, Frederick, "New Transport Policy Needed," vol. XLIV, Modern Transport, No. 1127, p. 5.

tion and Trunk Line Territories are not likely to be challenged in the near future, though air freight may later capture a portion of the more valuable trade. Service must be further speeded and special-service costs reduced. Top icing, improved insulation, and the use of dry ice all point to possible improvement in the loss-and-damage problem, as well as reduced costs of operation. Mechanical refrigeration does not seem to have become entirely practical, but experiments are continuing. In the meantime use of dry ice seems to give great promise of reduced cost and time in transit by reason of eliminating re-icing even on the longest hauls.

The retention of merchandise business on the rails depends primarily on the successful development of the various methods of coordination mentioned earlier. The short-haul business must be expected to gravitate to the motortruck, although severe competition must be expected from air-freight service on the longer hauls within a few years. The railroads may continue to offer a profitable coordinated merchandise service in the group of distances from about 400 to 1,500 miles. Present methods of operation must, however, be completely revised to eliminate the wastes resulting from the multiplication of competitive merchandise services.

In passenger traffic the railroad has been subjected to extreme competition, and strenuous effort will be required to enable it to hold its own. Heavy commutation traffic, overnight travel by sleeping car, and a considerable portion of the long-distance tourist traffic are fields in which the railroad has at present important advantages. Much of the short distance daylight traffic may be expected to use bus service because of lower fares, flexibility of service, more convenient and numerous stops, and greater frequency of service. As the cost of air travel is reduced, an ever-increasing proportion of the business traffic moving beyond the overnight rail range will use the air services.

The railroads can, by vigorous methods, retain a portion of this business. Modernization of equipment on a broader scale, further acceleration of schedules, and more frequent services[24] may enable stiff competition with the bus wherever a considerable volume of traffic is moving by common-carrier transport. Moreover, it must be remembered that, in passenger as well as in freight service, the railroads are best adapted to mass transportation. Where a sufficient company can be gathered aboard a train for movement between two points, the transportation can be accomplished at lower cost than by bus. Further experimentation with the rate structure is likely to be engaged in for the purpose of discovering how far the railroads can go in low-cost mass transport. In the light-traffic field and in local business, other than commutation, there appears to be scant place for rail service. Early substitution of more economical highway services must be looked to to eliminate growing losses from this type of passenger business.

[24] Again the problems of working rules and full crews inhibit the employment of light units in frequent service.

The Field of Motor Transport

The motor truck must continue to find its chief field of usefulness in terminal services, on the shorter hauls, and over longer routes where its speed can equal or exceed that of rail operation. Except in terminal areas and on hauls of very limited length it is not suited to the movement of bulk commodities as economically as rail and water services. In the merchandise business, however, profitable operations over a wide range are possible. Speed and flexibility of service, combined with favorable rates and minimum packing requirements, make truck merchandise service especially attractive. Most less-than-carload business, except on the longest hauls, may be expected to move by truck or by some form of coordinated service. The optimum arrangement for the longer hauls would seem to be a coordinated motor-rail service.

In areas of light traffic density, along branch lines, and in local service along major channels of trade, the motor truck has another important place to fill. Rail service is manifestly uneconomical in these fields as at present organized and, while the use of light rail vehicles for package-freight services has been attempted abroad, it would seem generally more economical to use highway motor carriers. It is apparent that, with the abandonment of rail service over many routes, an increasing area will be exclusively served by motor truck.

Bus transportation has important advantages in ordinary short-distance traffic and in cross-country traffic between the major channels of movement. It also provides frequent and economical service in the light-traffic areas which cannot be satisfactorily served by rail. However, except on local hauls, good rail service can offer substantial competition. One of the principal advantages which the bus exploits is a level of fares somewhat under the rail fare. A large volume of traffic is attracted, even on very long trips, by the economy of the service. If sufficient attention were given to the problem of fares and services for this type of traffic, the railroads could undoubtedly continue to handle much of it. It is difficult to see a likelihood of much bus expansion in the long-haul field, assuming the continuance of vigorous railroad competition with improved service and lower fares and the advent of more economical air service.

Water and Pipe-Line Transport

It is not at present apparent what the results of the provisions of the Transportation Act of 1940 regarding water transport may be. However, the elimination of bulk carriers from the sphere of Commission regulation

leaves the greater portion of the business unregulated. With the channels of movement already available and maintained, the operating costs for barge operations calculated on a ton-mile basis are very low.[25] It must be observed, however, that a large proportion of the inland water routes is circuitous compared to rail routes, and that the ton-mile figures calculated on water distances do not reflect the relative economy of water and land transport. Under favorable conditions certain types of bulk cargo can undoubtedly move more cheaply by water than by rail, and under present rate structures and methods of handling by rail a great deal of traffic can do so. A rearrangement of rail services and rates on a cargo basis may materially reduce the field over which bulk water carriage appears economical. Assuming that the railroads make a vigorous attempt to retain the cargo business, that user charges are assessed upon channels and facilities maintained by Governments, and that promotion by government and extension of Federal barge operations are curtailed, the prospects for inland water transport, save on the Great Lakes, may be limited.

In the common-carrier coasting services the influence of railroad competition is already being keenly felt. However, the difficulties making for high cost in the coastwise shipping are, perhaps, transitory. The high cost of port operation can probably be relieved, and the advent of new tonnage may improve the situation. Bulk carriage in the coasting trade, especially of petroleum, is conducted at costs far below any available land haulage. The only limiting factors upon this type of transport are availability of traffic, of bottoms, and of port facilities. In intercoastal operations, however, considerable circuity of haulage appears, particularly on the routes from North Pacific ports to North Atlantic ports. Under a train-load rate basis it is entirely possible that the railroads might compete in transcontinental business, particularly lumber, now moving by water. This is especially true of products ultimately destined for interior points.

Pipe lines have preempted the field in the internal movement of petroleum and natural gas and are beginning to be used extensively for the shipment of gasoline. They have taken a large volume of business from the rail carriers and occupy a strategic position that will probably enable them to hold their traffic. Although the railroads may be able to undertake train-load rates over some routes sufficiently low to meet pipe-line rates, it is questionable whether such rates will attract substantial volumes of traffic. The pipe lines are already constructed, they provide very economical transportation, and they are for the most part owned or controlled by the companies whose oil they move. Their position appears secure.

[25] Frequently as low as 2 mills per ton-mile.

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The Future of Air Transport

There has been much speculation regarding the future of air transport. Its traffic has been increasing at a rapid rate. Unquestionably passenger traffic, especially business traffic, will continue to grow at a rapid pace, making considerable inroads on rail business. Fare adjustments may place air transport on a more favorable comparative basis, and the air-travel habit will grow. Extension of feeder service to many points which now lack air service by the use of fast planes capable of getting in and out of restricted fields will broaden the base from which air lines will draw traffic.

In addition to expanding passenger traffic, it would seem the time is not far distant when first class mail traffic will move exclusively by the air whenever time is saved. Substantial expansion of the air express business may be expected. The present rate structure is not designed to attract this type of traffic. Costs of express business can be reduced to a level substantially equivalent to present rail express rates, if volume and regularity of movement are attained. A downward adjustment of rates may, therefore, be expected, and in the not too distant future the airways may handle most of the parcels and merchandise traffic which requires special dispatch. The advent of this business in volume will presage regular services by large merchandise planes, carrying traffic at much lower cost than is possible with express traffic as now organized. The mail and parcels business will probably be extended to many small communities by means of devices for picking up and discharging traffic while the plane is in motion. Such facilities are already in extensive use on several routes in West Virginia.

In the more distant future a large movement of freight by air may be anticipated as costs are reduced and volume grows. The surplus of equipment, pilots, and productive capacity at the end of the present emergency will promote a vigorous expansion of air transport wherever opportunities appear. The first cost of aircraft will be materially reduced, and the expanding volume of traffic will spread overhead over a larger base.

Qualifying Factors

All the foregoing suggestions concerning the division of traffic among the various types of carrier presuppose an adherence to the announced policy of the Congress to give recognition to the "inherent advantages" of the various types of transport. Allowance must also be made in considering the near future for the possible growth of private carriers and its effects upon the common-carrier services. Recent years have witnessed a phenomenal increase in private carriage. By far the largest portion of the passenger business, mostly new traffic, moves in private automobiles. This must be

expected to continue. Private flying has also grown rapidly but has not, as yet, attained major proportions. The organization of line-assembly and mass-production methods for light planes may, however, bring the cost of private flying well within the reach of a large part of the population. Accompanying such a development, the amount of private flying will undoubtedly increase but probably not at the rates predicted by the most sanguine aviation enthusiasts. The multiplication of private fliers on the airways will undoubtedly increase the hazards and pose difficult traffic problems. Until these are overcome expansion will be somewhat limited.

For handling freight traffic the motortruck is receiving extended application in the private-carrier field. It is widely used in the business of the farmer and in the movement of agricultural products. Numerous industrial, wholesale, and chain-store organizations are also conducting extensive operations. The effects of the private carrier have been keenly felt by the railroads and even by the common-carrier truckers. The rapid increase in the trucking of livestock to market, accompanied by the movement of a wide variety of farm supplies on the back haul, is but one example. Private truck traffic, once established, is not easily attracted back to the common carrier.

On the inland and coastal waterways the bulk of the service is performed by private carriers. Most of the oil, much of the coal and steel, and a great many other bulk commodities are moved in private-carrier operations. The unit of movement is, however, so much larger than upon the highways that comparatively few shippers can turn to private carriage. Nonetheless, the volume of business moving in this manner is large and provides a definite check upon the expansion of the common-carrier business.

Pipe-line transport is, to a large extent, in effect a private operation. In the field of air transport private carriage of goods is now being experimented with by a few firms who maintain planes to speed urgent shipments to various parts of the country. It may be expected to grow rapidly as costs are reduced and airport facilities multiplied.

The advent of private transportation on so large a scale has enormous significance for the common carriers. It takes from them large segments of business that they might handle with reasonable economy, reduces their volume, and weights all the remaining common-carrier traffic with greater burdens. Once the traffic is lost it is very difficult to regain it by rate concessions. Nevertheless, common-carrier service is essential to the great bulk of shippers whose volume between many points does not warrant the establishment of private transportation systems. In the interest of the public the common-carrier system must be preserved, and its operations must be conducted at sufficient volume to permit reasonably low cost. It is possible that the next few years may witness the development of strong pressure for the regulation of private carriers in the interest of maintaining an adequate and healthy common-carrier service.

The many possibilities for economy of transport cost, if fully exploited, should make possible a gradual lowering of the general rate level in relation to other prices. This result may be expected, barring efforts at inducing regional self-sufficiency, decentralization, and other similar developments, to increase the total volume of transportation business. Additional demand for transportation may also result from the advent of new products and services requiring distribution. Despite tendencies which appear at present to be reducing total volume of transport, a readjustment of price relationships may be expected to expand the demand.

Some of the present tendencies are, however, very strong and disturbing when their implications for common-carrier transport are considered. The shift from coal to oil fuel and to electric power transmitted at high tension over long distances; the rapid increases in combustion efficiency and in the efficiency of steam-generated electric-power transmission and use; and the increasing development of water power appear to strike heavily at the all-important railroad coal traffic. They must be offset to some degree by the advent of new industries using additional power and heavy raw and semimanufactured materials. Moreover, in the next decade, these developments are not likely to produce inroads upon traffic so far reaching as to affect the stability of the industry. They may be retarded and countered, in part, by reductions in the transport cost which represents so large a proportion of delivered fuel prices.

Shifts in industrial location and in raw-material uses cannot be explored here. Predictions are entirely unsafe. It may be said, however, that a policy directed toward securing the maximum economy of transport cost will enable the carriers to retain much business that might otherwise be lost through shifts in location.

The extended application of air transport, the early application of the fullest technical possibilities in all forms of transport, the coordination of terminals under public auspices, and the welding together of the various types of transport in a combined service of the greatest efficiency should provide the nation with the optimum development of transport facilities. Under wise public direction which seeks to place the general welfare ahead of that of communities and groups, the United States can keep in the forefront of transportation progress. The problems of policy involved will be dealt with at length in the later sections of this report.

PART I—SECTION II
THE INFLUENCE OF TRANSPORTATION ON THE LOCATION OF ECONOMIC ACTIVITIES

By Edward S. Lynch [1]

Introduction

Transportation exerts a very significant influence upon the location of economic enterprise. The fixed location of known resources, often separated from one another and from consuming populations by great distance and physical obstacles, necessitates well-developed transportation facilities to enable their economic exploitation. Differences in rates and in the qualities of service available between various sections of the country help determine which raw material sources, manufacturing locations, and marketing areas are most desirable. At times lack of facilities or prohibitive transport costs may inhibit or prevent the development of valuable resources.

A rather widespread belief exists that desirable changes in the location of economic activities and in the geographical distribution of the population can be effected through appropriate changes in transportation rates. Claims that particular regions are favored and others unjustly prejudiced by the relationships obtaining between transportation rates are perennial.

It is the object of this section to indicate the ways in which transportation influences the location of economic activities and to appraise the possibilities of using public transportation policy to control the geographic distribution of people and of industry. Only one phase of the transportation problem and only one aspect of the locational problem are considered.[2]

The Exploitation of Natural Resources

The location of mining, forestry, and agricultural activities is bound, of necessity, to the natural resources concerned. Several factors determine which of several sources of raw materials are utilized and the extent of their exploitation: Relative costs of production at the various sources, the location of the market, the pricing policies pursued by producers variously situated, and the costs of transportation from the various sources to market.

Variations in the relative prosperity of mining regions have frequently resulted from changes in the relationships existing among transportation rates charged various sources. Operations in the Southern Appalachian coal fields were long inhibited by lack of suitable transportation facilities. The development of good all-rail connections to the West and the disruption of coal marketing during World War I impelled railroads to offer excellent rates from West Virginia mines to northern and western markets. A great expansion in coal-mining operations resulted in southern West Virginia largely at the expense of Pennsylvania and Ohio fields. The development of motor transport, which caused a change in the relationship between rates on long and on short hauls in favor of the latter, has also brought about significant shifts in the location of coal production. In the late twenties, the area within 25 or 30 miles of St. Louis, known as the Belleville field, became studded with small coal-mine operations, which had theretofore been effectively discouraged by a railroad freight rate structure that favored shippers of higher grade coals beyond 100 miles to the east of St. Louis. The reason for the apparent discrimination against short-haul shippers into St. Louis was the expense of transfer from East St. Louis to St. Louis. Highway operations were furthered by the construction of a municipally owned toll-free bridge connecting the two cities. In 1938, the major portion of St. Louis' coal supply came from the Standard Belleville field; most of it by truck.[3]

Variations in the prosperity of agricultural areas as a result of changes in transportation rates and service are well known. Relative transportation charges on potatoes have been important influences in the competition of producers in Maine, Idaho, Michigan, and New York with one another. The increase in freight rates after the first World War is said to have redounded to the advantage of New York producers located near major consuming markets and to the disadvantage of growers in Idaho and Michigan.[4] Relative charges for transporting feeds and livestock have dictated the degree of specialization by various regions of the country in the production of one or the other. The compe-

[1] Research Assistant Professor, Iowa State College, and Consultant, National Resources Planning Board.

[2] The National Resources Planning Board is now preparing a study of the factors influencing the location of industry.

[3] Rail shipments of coal into St. Louis have increased greatly since April, 1940, when an anti-smoke ordinance practically forced domestic consumers to use a better grade of coal. At the same time, the railroads put in a trainload rate of $2 per ton, compared with a previous carload rate of $3.05 per ton, from Arkansas mines.

[4] H. S. Gabriel, *Index Numbers of Freight Rates and their Relation to Agricultural Prices and Production*, Bulletin No. 446, Cornell University Agricultural Experiment Station, 1925, pp. 31–31.

tition in eastern markets of orange growers in California with those in Florida would have been much less intense if railroads serving the former producers had not "blanketed" the entire eastern part of the country for rate-making purposes. Until recently, transportation charges on oranges from California were the same to New York City as to Denver, Colo.

Manufacturing

Attraction of Material Sources and Markets

Much greater freedom of choice exists for the location of manufacturing plants than of raw material production. But the location of the latter exercises a profound influence upon the geographical distribution of manufacturing. Unless particular areas and sites are especially favored by relatively low production costs for other reasons— the availability of a low wage or of a highly skilled labor force, for example—particular manufacturing processes will be located with primary reference to the sources of their materials and to the markets for their products.

The question, will processing occur near the source of raw materials or near the market for the finished product, is relatively easy to answer where but one material is used, only one commodity produced, and transportation costs are reflected directly in price.[5] Fabrication will occur near the source of the material if it costs less to transport the product than the material and near the market if the contrary situation exists.

The attraction of the raw material source will be more marked, the greater the weight loss in fabrication[6] (sometimes called the "conversion loss"), assuming equal ton-mile rates. It is not surprising, therefore, that copper and lead smelters and refineries, wood distillation plants, planing mills, cotton gins, and beet-sugar refineries are usually located very near to the materials which they employ. Freight rates per ton-mile on the finished products can, of course, be made sufficiently high and on the raw materials involved sufficiently low, to offset the influence of weight loss in manufacture upon location and thus to make location near the market more profitable.

However many materials enter a product, however many products are produced jointly from the same materials, the same principles apply. To the extent that one material or one product involves greater cost of movement than others, its source or market will have a correspondingly greater influence upon location.

[5] The offsetting influences of industrial pricing policies on transportation rate changes discussed in Part I, Section III, 1 of this report.

[6] That is, the greater excess of weight of the material over that of the product.

Transit privileges are commonly accorded in the flour-milling, lumber, cotton-compressing, and other industries. They have had important effects upon the location of flour production. Mills located at points where the privilege is granted can stop grain for milling and reship it as flour to consuming markets on the through rate applying from point of origin for the grain to final destination plus a small transit charge. Thus they save the difference between the local rates applying to the two segments of the movement and the through rate plus transit. The privilege has been available at relatively few points and has fostered concentration of milling there. It began originally in the eastern states to enable eastern mills to compete with those being established near the grain fields of the central west. Later the privilege was extended westward. It has been an important factor in facilitating the growth of flour milling in the southwest, and its extension to a larger number of milling centers has aided considerable relative dispersion of the industry.

Rates

Carriers typically charge rates that rise with the progress of fabrication from raw materials to final products. The result is a tendency for manufacturing to be located away from the source of raw materials and close to market—unless the weight loss in fabrication is sufficiently great to offset the difference in rates, or unless the service rendered manufactures is so much superior to that afforded materials as to offset the tendency.

The relationship between rates on materials and manufactured goods is partially based on differences in the costs of hauling them. The transportation of crude oil by pipe line, for example, is cheaper than by railroad tank car or by motortruck. As a result, refineries have been located near the markets for oil products or at tidewater, where cargo tankers are available to carry the refined products to market at relatively low charges. In general, manufactured goods load less heavily than materials, are more liable to loss and damage, and receive more expedited service and other service advantages; they are, therefore, more costly to transport.

The fact that competition among carriers is limited also accounts partially for differences in rates on goods of varying degree of fabrication. That is, differences in the demand for transportation as well as differences in costs influence the rates established by carriers.

Although the practice is general of charging rates that progress with the stage of fabrication, it is by no means universal. On shipments east, hogs carry higher rates than do products obtained from processing them, although the weight loss is about 25 or 30 percent. The

result, along with other factors, has been the development of the packing industry in the western corn belt.[7] This trend was furthered by the development of motor-truck operations in the twenties, which resulted in lower rates on hogs for short hauls. Similar circumstances have from time to time surrounded the movement of other livestock.

The practice of carriers of increasing their charges with distance,[8] but at a diminishing rate, causes total transportation charges to be lower if manufacture occurs at the material source or at the market than anywhere else, since the sum of two short-haul charges on the same or similar articles is greater than a single long-haul charge. Unless, then, processing costs are sufficiently lower at some other place to offset its disadvantage in transportation costs, fabrication will tend to occur either at the source of the material or the market—the assumption made in preceding pages.

The influence of the market upon the location of manufacturing has been lessened as a result of the greater number of competitive reductions in rates on fabricated products than on raw materials, as a result of the development of motor transport.

Although there has been a tendency for common-carrier truckers to adhere rather closely to the rate structures developed by the railroads, their rate policies have nevertheless shown marked deviations from those formerly pursued by the latter. In New England, motor carriers for hire have established their own rate structure with little regard for railroad theories on the matter.[9] Shippers operating their own trucks are of course not at all bound by railroad rate policies on the traffic which they carry. Moreover, potential as well as actual operation by shippers of their own trucks has influenced motor carriers and railroads in establishing their own rates.

Service

Costs of movement include more than the bare hauling charges of transportation agencies or the expenses to shippers of operating their own vehicles. The quality of the service rendered also is an important consideration to producers.[10]

Speed is one of the most vital qualitative aspects of transportation. In its widest sense, it includes not only the actual time in transit, but also the frequency and dependability of carrier schedules and their degree of correlation with production schedules.

Goods in transit may represent a considerable absorption of working capital. It is customary for zinc and for electrolytic copper to be sold at delivered prices which include interest on the value of the product while it is in transit.[11] Increased over-all speed of transportation also reduces storage requirements; as a result interest on the value of the goods stored, the expense of providing or renting warehouse space, and the risks of price declines on inventory are diminished.

Where the interest cost on goods in transit and in storage is substantial, there is some incentive to locate manufacturing processes in proximity to their markets, for the value of fabricated products is greater than that of the materials of which they are made. One of the reasons suggested for the rise of Buffalo as a flour-milling center after the first World War was the saving in transit time on flour destined to eastern markets that was thus achieved. In earlier years the three to five weeks in transit on the Great Lakes contributed to the requisite aging of the flour, but general adoption of the bleaching process gave new significance to time in transit.[12] The influence of the market is reduced if over-all speed on fabricated products is greater than on materials, as is frequently the case. The development of speedy transportation, in recent years, has probably contributed somewhat to the decline in the importance of the market for the location of manufactures.

Economies of Scale and Differential Production Costs

The extent to which potential economies of large-scale production are exploited depends upon the level of transportation charges and the service rendered by carriers. Concentration of output in one plant or at a single raw material source is promoted by lower transportation charges, both on the materials used and on the product to the various markets served.

Similar considerations obtain where any site affords opportunity for production at abnormally low costs—because of an especially favorable labor situation, for example. Provided materials are reasonably accessible, the home market can be preserved to high-cost industries by a high level of transportation charges and inferior service from other producing areas.

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[7] *Direct Marketing of Hogs*, U. S. Department of Agriculture, Misc. Pub. No. 222, 1933, pp. 6–7, and 77–87, *et passim*. Transportation rates on hogs shipped westward are relatively very low in comparison to rates on meat products; packing plants have accordingly been located on the Pacific coast in order to supply that market for meat.

[8] As noted later, there are numerous exceptions to this principle.

[9] *New England Motor Carrier Rates*, 8 M. C. C. 287 (1938).

[10] Dr. Julius Parmelee writes, "It is impossible to estimate the exact savings improved rail efficiency has stimulated. It has been estimated, however, that manufacturers, shippers, and dealers, generally, have reduced their working capital by one-fourth. This reduction alone means millions of dollars of annual savings to them." *The Modern Railway*, Longmans, Green and Co., New York, 1940, p. 237.

[11] Saul Nelson, *Price Behavior and Business Policy*, Temporary National Economic Committee, Monograph No. 1, 1940, p. 339.

[12] Victor G. Pickett and Roland S. Vaile, *The Decline of Northwestern Flour Milling*, University of Minnesota Press, 1933, p. 47.

Changes in the levels of transportation rates, unaccompanied by changes in the percentage relationship obtaining among individual rates, influence location by increasing the absolute differences between specific rates. The trend of the packing industry to the western corn belt discussed above was furthered by the larger spread between the charges for hauling hogs and meat products that resulted from the general percentage increases in freight rates during and after World War I. Equal percentage increases in transportation rates also increase the spread between long-haul and short-haul charges, thus reducing production cost advantages held by shippers located more distance, freightwise, from their markets, while equal percentage reductions have just the opposite effect. In general, then, increases in the levels of transportation charges tend to greater decentralization, and reductions in those levels to concentration, of production.

If prices in general change, while the level of transportation rates remains the same, the effect on location is the same. With falling prices, transportation becomes relatively more expensive, and decentralization of industry is fostered. Some of the dispersion of industry that typically occurs in periods of depression can be attributed to the maintenance of freight rate levels while prices generally are falling. On the other hand, if prices in general rise and transportation rates remain unchanged or fall, the effect is to increase the localization of industry, and the magnitude of trade between areas.

Although decentralization of production can be achieved by making rates so high and service so bad as to discourage the use of transportation facilities, a thoroughly economical transportation system might effect greater decentralization than now exists. The separation of production into numerous stages from raw materials to final products, with each stage carried on where peculiar labor and other cost advantages dictate, is discouraged by high rates, and would be stimulated if service were further improved and rates reduced. Freedom of location generally would be enhanced by still greater efficiency in transportation and lower costs of transportation service. The attraction for manufacturing of the sources of materials whose conversion (weight) losses are large is diminished by relative reductions in transportation costs.

Trade

Transport costs exercise a significant influence upon the location of trading activity. It has been suggested that "rate relationships play a more important part in the location of market centers than in the location of industries, because other factors, such as labor costs, are comparatively unimportant to commercial enterprises. In general, goods will be bought and sold through markets established at points having the lowest combination of rates.[13]

Influence of Transportation Upon Urban Concentration

Transportation has probably had more influence upon the relative size of urban communities than upon the interregional distribution of production. If a particular site enjoys more favorable transportation rates on raw materials and on processed goods manufacturing and trading activities will gravitate to it, unless other costs of production are sufficiently greater to offset its transportation advantages. Similarly, more frequent, more dependable, more convenient, and speedier service afforded by carriers to a particular location than to surrounding areas will cause production to be attracted to it. The very fact that productive enterprise is attracted to a particular center provides a further attraction to industries which, for transportation reasons, tend to be located at the market.

Rates

Most of the major manufacturing and trading centers of the country have access to cheap water transportation. It has been indicated that "About half of the [major manufacturing] areas are located on deep water, and many of the remainder have access to navigable rivers."[14] Such locations afford great advantages in the assembling of materials for some manufacturers over places not so favored. Moreover, producers and merchants located there are also favored in marketing products for which speed of transportation is not of great importance.

In order to meet water competition the railroads have charged less to Pacific coast ports than to adjacent communities in the interior. The practice of charging less for long hauls than for shorter hauls in the same direction and included within them is not confined to rail-water competition. It also commonly occurs to enable circuitous railroad routes to meet the short line route. In some instances at least, truck operators maintain that higher rates to intermediate cities than to large terminal cities are justified because of higher costs entailed in serving the former. In *New England Motor Carrier Rates*[15] it was shown that often goods were actually transported through to major terminal cities and hauled back to the intermediate cities concerned. Moreover, many truck operators "handle traffic principally in truckloads between important commercial

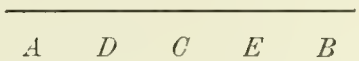
[13] D. Philip Locklin, *Economics of Transportation*, Rev. Ed., Business Publications, Inc., Chicago, 1938, p. 126.

[14] Glenn E. McLaughlin, *Growth of American Manufacturing Areas*, University of Pittsburgh, Bureau of Business Research Monographs, No. 7, 1938, p. 13.

[15] S M. C. C. 287, 297 (1938).

centers only and are thereby able to cut rates on such traffic."[16] Although the amount of air-freight traffic is as yet relatively insignificant, it is nevertheless of some importance for certain kinds of manufactured products and is carried only between major centers.

Legal restrictions on the practice of charging more for short than for long hauls where the former are included within the latter has resulted in another rate-making policy, which also tends to attract industry and trade to major centers. Railroads commonly make relatively low rates on traffic to and from "key" cities, as the Commission calls them, and group such rates back over an intermediate area of greater or less extent.[17] If the intermediate area concerned were the same on hauls in all directions, the "key" cities would have no advantages over other cities in the same area. In fact, however, the "key" cities do enjoy a transportation rate advantage over neighboring cities. A simple illustration will suffice to bring out the main details of this system of disparate blanketing.



Let us assume that C is a "key" city and A and B are sources of raw materials. D and E are other points served by the railroad concerned. On traffic from A, charges to all points between D and C, inclusive, are the same; on traffic from B, charges to all points between C and E, inclusive, are the same. On traffic from A charges to E are higher than those to C, while charges on traffic from B are higher to D than to C.

It can readily be seen that a manufacturing enterprise that requires raw materials from both A and B will find C a more advantageous location, so far as assembly costs are concerned, than either D or E. Furthermore, E is in no more favorable position than C, for sales to B while its position is inferior in marketing to A. A similar relationship obtains between C and D. Thus a system of grouping, which in every direction favors a "key" city, affords manufacturers and traders located there decided advantages in transportation charges over competing cities in its territory. Blanketing of rates in this fashion is also practiced by motor carriers—sometimes over rather long distances.[18] The position of C, in the above illustration, would be even more advantageous and its size greater, if a number of transportation routes converged on it and similar groups were provided on the various routes. In fact, such a convergence of routes on a city is frequently the occasion for the establishment of "key" rates because of competition in marketing and purchasing of producers along the various routes.

The creation of a rate group and the establishment of uniform transportation charges between all points within it and each place beyond its borders has a restrictive effect on urban concentration. The old Texas common point system created a very broad area in that State between which and particular outlying points transportation charges were the same. As a result, a much larger number of trading and manufacturing centers were established than would otherwise have been the case, and no single urban area was able to assume dominant importance in the State. While the establishment of this group system of rate making was primarily a result of the peculiar interlacing of independently owned railroad routes and the competitive relationships resulting therefrom, the policy of the Texas Railroad Commission in its early days seems also to have been a major factor in its establishment. It has been suggested that the "blanketing of rates to and from all points in New England when the points of origin or destination were in the West has long had a decentralizing effect on industry in New England."[19]

Grouping on a relatively narrow scale occurs by virtue of the railroad policy of extending the same rates to all points within the terminal limits of a city, which in many cases extend beyond its political boundaries. The result is that, so far as transportation rates are concerned, location anywhere within the terminal limits is equally advantageous. The relatively extensive economic development of the suburbs of Chicago has been attributed to the fact that the Chicago terminal area is rather wide.[20] The establishment of free pick-up and delivery service by railroads in recent years has reduced the influence of cheap transportation rates upon location in the heart of urban areas, and the establishment of similar service by water carriers has influenced the movement of industry to the suburbs of major port cities.

Service

Significant differences exist in the quality of transportation services available to various localities. Not all localities are directly served by one or another of the various kinds of transportation agency. The commercial air routes of the nation afford direct service to fewer

[16] *Central Territory Motor Carrier Rates*, 8 M. C. C. 233, 253 (1938).

[17] *Western Trunk Line Class Rates*, 164, I. C. C. 1, 208–9 (1930); *Eastern Class Rate Investigation*, 164 I. C. C. 364, 414–15 (1930).

[18] The same rate was charged from Winston-Salem, N. C., to Atlanta, Ga., 395 miles, as from the former point to Nashville, Tenn., 645 miles. The Commission held that the rate to the latter point was unreasonably low (cf. *Cotton Clothing and Underwear in the South*, 10 M. C. C. 691, 698, 1938). But it has approved of this form of rate making by motor carriers in numerous cases (*Central Territory Motor Carrier Rates*, 8 M. C. C. 233, 250, 1938; *New England Motor Carrier Rates*, 8 M. C. C. 287, 307, 1938).

[19] Locklin, *op. cit.*, p. 123.

[20] William N. Mitchel, *Trends in Industrial Location in the Chicago Region Since 1920*, University of Chicago, Studies in Business Administration, vol. IV, 1933, p. 69.

than 300 communities. The number of gasoline and crude-oil and natural-gas pipe-line terminals is relatively small. Carriage by water is, of course, immediately available to relatively few communities. The Automobile Manufacturers' Association annually reports that more than 40,000 communities are without railroad service and dependent upon motor-vehicle operations.

There is little doubt that large communities are afforded better transportation than smaller centers. Information concerning transportation schedules and rates is not always as readily available to shippers in small communities as it is in larger cities. This is especially true of places that do not enjoy the services of a transportation agent. The files of the Iowa Commerce Commission disclose almost as much opposition from shippers to the withdrawal of a local railroad agent as to the abandonment of a branch. Moreover, in large urban centers chambers of commerce frequently perform the functions of industrial traffic managers for their members. Railroad, common-carrier truck, water-carrier, and air-freight schedules are typically made with a view to the convenience of producers located at major terminals. Greater convenience and over-all speed of transportation are also afforded producers as a result of the more frequent schedules operated by carriers competing for traffic between large cities. Frequency of schedules results also from the very magnitude of the traffic hauled between such places. Lesser stations along railway routes and smaller communities along highway routes are frequently by-passed in the interest of fast service between large communities. The result is a differential advantage in speed and frequency of transportation between such places as against smaller centers. Other transportation agencies that employ the above media, freight forwarders and the Railway Express Agency, have also contributed to better service between localities of major traffic importance.

The very increase in transportation speed in recent years has rendered more profitable the concentration of merchandising activities in the very largest cities, to the disadvantage of even relatively large trading centers. In explanation of the decline of warehousing in Minneapolis, Vaile and Nordstrom write, "the general improvement in transportation service has operated to permit manufacturers to consolidate their warehouse stocks at the more important distribution centers. * * * The time on carload shipments [between Chicago and Minneapolis] has been reduced from 3 or 4 days to 36 hours. As a result in some lines it is no longer necessary to carry stocks of merchandise in both Chicago and the Twin Cities." [21]

[21] *Public Merchandise Warehousing in the Twin Cities*, University of Minnesota, Studies in Economics and Business, Bulletin No. 3, 1932, p. 40.

Limitations on the Effects of Transport Factors

Immobility of Production Resources

A relative increase in freight rates on its product to market or on the raw materials used will seldom result in immediate and complete shut-down by a firm operating with a large investment in relatively durable and specialized plant and equipment. Unless the increase is so great as to render its investment valueless, it can be absorbed and production continued, though possibly on a reduced scale, until need for replacement of plant and equipment arises.

Moreover, a reduction in freight charged to a competitor located elsewhere which leads him to lower his price will not usually enable him completely and immediately to absorb the market. The failure of an even more rapid advance in the packing industry to occur in the western corn belt area, in view of freight rate, wage, and other advantages is attributed to the fact that very large and relatively durable investments had already been made in Chicago and elsewhere.[22]

Because reinvestment in various lines of activity tends to be made at different periods of time and very largely with a view to the existing locational structure of suppliers and of markets, the process of relocation as a result of a change in freight rates is very slow and likely never to be completely achieved. The theory and facts relative to the effects of the varying times at which replacement of worn out and obsolete equipment occurs have unfortunately not been very well developed.

Increased transportation costs may be borne partly by the workers, especially when they are unorganized, because their geographical mobility is restricted by the expense of movement, including partial loss of investments made in the locality concerned, and by natural psychological resistance to movement. Labor, in other words, together with all other relatively immobile productive factors, including transportation facilities, participates in the competition of the combined resources of one region and those of another for common markets. Similarly, labor may reap all the benefits from an improvement in the transportation situation. Although there is relatively little physical relocation of plants, production of particular commodities does expand in one region while it contracts in another. Among the factors that bring about such movements are changes in transportation charges and services. Moreover, the movement of an industry from one region to another and from one site to another is very unlikely to be an isolated phenomenon. It is very likely to bring about changes in the location of industries supplying it and of indus-

[22] U. S. Department of Agriculture, Misc. Pub. No. 222, *The Direct Marketing of Hogs*, 1935, p. 9.

tries dependent upon it for supplies. Just as the relocation of economic activities is typically a very slow development, so once it occurs it is likely to be cumulative in its effects.

Geographical Pricing Policies[23] and Transportation Rates

Pricing policies in the nontransportation area of the economy frequently offset the influence of changes in freight rates upon location. Where competition is limited,[24] the prices that buyers are asked to pay are likely to vary by more or less than the transportation expenses involved in getting the goods to them. "Freight absorption" and "freight pick-ups," of greater or less amount, by the seller occurs.

If competition in price is deliberately avoided, it is entirely probable that a reduction in the costs of a producer who does not "make the price" (who simply "meets competition") will not result in a lowering of his price, and that increased costs will not impel him to raise his price. Moreover, a reduction in his costs will not necessarily result in an extension of, nor an increase in his costs to withdrawal from part of, his market.

A producer, who will not lower his price, can extend his market only by increasing sales effort, rendering superior service, or bettering his product. If the product concerned is a standardized one, reductions in costs cannot be reflected in improvements in the product, and industries with highly formalized geographical pricing systems usually sell standardized products. Frequently, a producer cannot sell as much as he would like in a particular market, and further sales effort might result in little or no addition to sales.[25] For that reason, increased costs of serving a particular market will not necessarily result in a withdrawal from it, nor even in a reduction of sales expenditures there. Thus, there is no evidence that Pittsburgh steel mills have concentrated sales effort within those areas in which freight added tends to exceed freight paid, and this fact is not surprising.[26]

Changes in freight rates from a mill or mine that does not "make the price" will not affect the delivered price to the market concerned and so will have no effect upon the location of firms purchasing its product. They may also have no effect upon the location of the industry producing the goods concerned. "The mill, whose base price and freight rate made the Chicago delivered price in 1927, is located near Chicago. This mill's output for that year was more than 9 million barrels [of cement], while Chicago's consumption was about 3,800,000 barrels. Less than one-third of this consumption was supplied by this mill, which at the same time shipped large quantities long distances on which it realized a mill net far below that realized on its Chicago shipments."[27]

Peculiarities in the calculation of freight charges in arriving at delivered prices also offset the effect of transportation rate changes upon the location of buyers of the goods concerned. Thus, it is apparently customary for industries using zone systems of pricing, to average freight charges to the various markets within each zone in order to determine the delivered price charged throughout the zone. The buyer in the particular market affected by an increase in freight rates is not, therefore, placed at a disadvantage in competition with other buyers in the zone. This is most striking where nationally uniform delivered prices, as in aluminum, are charged. Even when freight rates are added to mill-base or other base prices the effect of an increase or reduction in transportation rates upon delivered prices and so upon location is uncertain, unless actual rates are used. "Oak flooring is sold in a multiple basing point system. * * * Prices are quoted f. o. b. destination and include full freight from the basing point most favorably situated. The computed freight is rounded at 50-cent intervals."[28]

Transit privileges operate to distort the effects of "administered prices." In some instances, buyers availing themselves of transit privileges actually pay less than the delivered price established for the locality in which they operate. Because of transit privileges, manufacturers sometimes find it advantageous to purchase from distant mills rather than from the mill that "makes" the price. Moreover, manufacturers using materials sold on a delivered price basis find it advantageous, in certain instances, to be located at some dis-

[23] For a description of various kinds of geographic pricing policies, cf. Saul Nelson, *Price Behavior and Business Policy*, Temporary National Economic Committee, Monograph No. 1, part II, pp. 273–4.

[24] "In a country-wide survey of the price-basing methods used by manufacturers, it was found that of the more than 3,500 reporting firms, including manufacturers in practically all industries, 44 percent sell on an exclusively shipping-point price basis, 18 percent on an exclusively delivered price basis, and 38 percent on both bases." (*Report of the Federal Trade Commission on Price Bases Inquiry*, 1932, p. XIV.) Of the firms selling exclusively on a shipping-point price basis, "15 percent make all or a part of these prices with partial freight allowances." *Ibid.* In other words, 63 percent of the firms studied sold all or part of their outputs with some form of "freight absorption." It is probable that the practice has been extended since 1928 when the study was made. Not only do manufacturers quote prices in disregard of freight expense to market; the practice is also quite common in the bituminous coal and other mining industries and in the sale of lumber.

[25] In other words, the equating of marginal revenue and marginal cost is frequently impossible where competition in price is not practiced.

[26] C. R. Daugherty, M. G. De Chazeau, and S. S. Stratton, *The Economics of the Iron and Steel Industry*, McGraw-Hill, New York, 1937, pp. 686–691.

[27] Gustav Seidler, Jr., *The Control of Geographic Price Relations under the Code of Fair Competition*, N. R. A. Trade Practice Studies. Work Materials No. 86, 1936, pp. 36–37.

[28] Saul Nelson, *op. cit.*, p. 309.

tance from mills selling those materials, partially because of favorable freight terms accruing from the combination of administered prices and transit privileges. Although this matter has received widest publicity with respect to steel fabricators, it may have important implications wherever materials are not sold f. o. b.[29]

It is likely that the transportation rate structure and geographical pricing policies in certain industries are intimately related, so that a change in either may result in offsetting changes in the other. Thus, the practice of making the price of gasoline through a sizeable area in the Midwest equal to the base price at Tulsa, Okla., plus railroad freight rate to destination, had its origin in the fact that railroad freight rates were the same[30] to every point in the Midwest from each point of origin in the midcontinent producing area.[31] This pricing practice continues, although gasoline pipe lines have since been constructed and carry gasoline at costs that vary with distance and are much lower than the railroad rates.[32] During the N. R. A. minimum mill prices were established for lumber in areas other than Southeast. In that section, delivered prices involving freight absorption were established. One commentator has suggested that the reason for this difference, demanded by mills in the Southeast, was the fact that "freight rate groups in this territory (particularly in the Carolinas and Virginia) are smaller * * * thus bringing the effect of freight rate differentials more strongly to the attention of industry members in this area."[33] Railroads, interstate motor carriers, and certain water carriers are prevented from making a larger charge for a short haul than for a long haul in the same direction when the former is included within the latter except where relief is granted by the Interstate Commerce Commission. But substantially the same result, so far as purchasers of the goods in question are concerned, occurs when producers charge a lower price at a place more distant freightwise from their plants, as they sometimes do in order "to meet competition." The policy of certain industries of restricting the use of innovations in transportation, like the motor truck, is another example. In the steel, cement, and other industries, trucks may be used by buyers to transport their purchases; but they must, in effect, pay a higher mill price than would be charged if railroad transportation had been used.

There is, on the other hand, evidence that the maintenance of geographical pricing policies by industry is sometimes assisted by the rate policies of carriers. Maintenance of the basing point system of pricing for refined sugar would probably be impossible were it not for the rate adjustment that has been observed by railroads for many years. Even motor carriers sometimes make rates which enable firms to pursue, without change of location, pricing policies that ignore differences in transportation costs.[34]

Although in some instances changes in freight rates may not give rise either immediately or in the long run to locational shifts, in others they are the occasion for shifts in the location of buyers or sellers, or both—even when prices of the goods concerned do not vary precisely with transportation costs. Freight rates from a mill to a particular market may be increased by a sufficient amount to induce that mill to withdraw from the market, unless it "makes the price" there. In numerous cases, producers set limits to the amount of freight that they will absorb in their delivered price.[35] Where this practice exists, an increase in freight rates to a particular market, which causes the delivered price thus calculated to exceed the prevailing price there, will impel the producer concerned to withdraw; unless, of course, his product is differentiated from those of competitors, in which case there is no "prevailing price," and the result will probably be simply some, though not necessarily complete, loss of sales.

Changes in the geographical distribution of many industries in which noncompetitive pricing policies are pursued are known to all students of the matter. While changes in transportation rates do not always result in changes in the price structure of an industry, they do change the relative profitability of operations at existing locations and, if sufficiently large, cause some shift

[29] The following hypothetical example outlines the principal features of this subject:

A *B* *C* *D*

C is the location of a manufacturer using materials which may be purchased from producers at *A* or *B*. *D* is the market for *C*'s product. Mills at *B* make the delivered price for sales to *C* and mills at *A* meet the price. The base price at *B* is $40 and the freight charge from *B* to *C* is $3, so that the delivered price for *C* is $43, whether purchase is made from *A* or *B*.

The freight charge from *B* to *D* is $9, from *A* to *C* $9, and from *A* to *D*, $14.

If he purchases from *B*, the manufacturer at *C* pays $43 and gets a railroad bill of lading, whereby he may send an equivalent weight of his product to *D* for $6 ($9−$3) plus the transit charge. If he purchases from *A*, he also pays $43 and gets a bill of lading enabling him to ship an equivalent weight of his product to *D* for $5 ($14–$9) plus the transit charge.

It is, therefore, more advantageous to purchase from *A*, unless the speedier service from *B* is worth $1 or more.

Manufacturers at *C* also enjoy an advantage over competitors at *B* or *D*, unless the transit charge is $1 or more.

[30] The condition has existed for about 20 years, cf. Brief of Gwenrud, Temporary National Economic Committee, Hearings No. 15, exhibit 1206, p. 8707.

[31] Saul Nelson, *op. cit.*, p. 342.

[32] The practice is, however, gradually breaking down as a result of the development of "new oil fields in Illinois, Michigan, and elsewhere." (Saul Nelson, *op. cit.*, p. 342.)

[33] Gustav Seidler, *op. cit.*, p. 108.

[34] *Western Territory Commodity Rates and Ratings*, 17 M. C. C. 511, 514 (1939).

[35] Saul Nelson, *op. cit.*, pp. 278, 296 and *passim*.

in location. Such shifts may result from integration policies of buyers of the product, who seek thereby to escape from the burden of paying monopolistic prices.

Effects of Freight Rates on Regional Manufacturing Development

Freight rates influence the amount of manufacturing carried on in the various sections of the country through their effect on the assembly costs of the materials used and on the costs of marketing manufactured products. Manufacturers located in a particular area enjoy advantages over competitors located elsewhere if their rates on raw materials are lower than those of their competitors. Similarly they enjoy a competitive advantage if their rates on the finished product to important consuming areas are lower than those of their rivals. Important differences in economic development and transportation conditions in broad regions of the country have given rise to much discussion of the differing rate systems prevailing in the three major classification territories and their effects upon the economic development of those areas.

Differences in regional rate structures, originally dictated by the economic conditions of the region served, tend to be self-perpetuating, for carriers in each region strive to protect the traffic that their rate policies have fostered against encroachments by carriers in other regions. An instance of this is the refusal of carriers in the northeast to join with southern carriers in the quotation of relatively low through rates on certain northbound manufactured goods, which would thus be brought into competition with products of shippers on their own lines.[36] It should be observed that there are exceptions to all systematic rate structures. Carriers, especially railroads and steamship lines, frequently offer especially low rates in order to induce new industries to use their facilities; the industrial location department plays a very important role on many railroads. Public regulatory bodies, especially the Interstate Commerce Commission, have brought about changes in freight-rate structures and have thereby influenced the location of economic activities. Furthermore, new agencies of transportation, such as the highway carrier, tend to upset traditional systems of rate making.

The question of whether or not one region of the country has been unduly discriminated against in comparison with other sections as the result of freight rates has been discussed with great acrimony for many years. The question of discrimination is not, however, germane to this discussion. The factor of

[36] Cf. *State of Alabama et al. v. the New York Central Railroad Co. et al.*, 235 I. C. C. 255, 329 (1939).

TABLE 1.—*Summary Statistics of Intra- and Inter-Regional Carload Traffic, Dec. 13, 1933*

Origin	Destination	Ton-miles	Revenue per ton-mile	Average load	Average haul
ALL CARLOAD TRAFFIC					
United States	United States	511,147,307	$0.0109	27.7	375.5
Eastern	Eastern	144,406,509	.0121	32.5	229.4
	Southern	11,631,154	.0127	21.2	605.6
	Western	25,139,499	.0112	23.4	702.8
Southern	Southern	48,872,743	.0104	37.8	215.9
	Eastern	71,858,860	.0076	37.6	557.1
	Western	10,972,257	.0091	28.9	887.8
Western	Western	116,163,607	.0119	26.4	328.6
	Eastern	66,415,748	.0104	18.3	1132.2
	Southern	15,686,930	.0106	20.6	907.9
PRODUCTS OF AGRICULTURE					
United States	United States	111,059,976	0.0118	20.8	577.1
Eastern	Eastern	17,874,822	.0118	25.3	328.7
	Southern	3,188,687	.0105	20.0	633.9
	Western	1,459,938	.0129	17.0	832.5
Southern	Southern	4,028,454	.0172	17.6	251.9
	Eastern	5,296,940	.0168	15.5	1002.3
	Western	1,308,672	.0161	14.9	1172.1
Western	Western	39,297,644	.0125	25.2	380.1
	Eastern	30,661,275	.0095	17.3	1772.5
	Southern	7,479,544	.0103	19.7	1291.9
ANIMALS AND ANIMAL PRODUCTS					
United States	United States	30,220,773	0.0172	12.7	579.8
Eastern	Eastern	5,223,319	.0179	12.7	436.4
	Southern	779,443	.0190	12.3	801.3
	Western	220,808	.0154	12.7	726.9
Southern	Southern	337,015	.0220	11.9	332.3
	Eastern	400,662	.0184	13.1	448.9
	Western	49,302	.0141	13.3	620.0
Western	Western	7,576,908	.0173	12.5	414.1
	Eastern	12,900,412	.0164	12.7	788.8
	Southern	2,722,864	.0144	14.6	1159.4
PRODUCTS OF MINES					
United States	United States	243,556,041	0.0092	43.8	241.5
Eastern	Eastern	86,260,139	.0109	46.2	167.7
	Southern	1,571,060	.0125	35.1	290.5
	Western	7,435,514	.0085	37.4	270.0
Southern	Southern	36,538,535	.0087	50.4	216.7
	Eastern	54,855,156	.0061	51.7	453.4
	Western	5,880,830	.0058	45.1	735.9
Western	Western	41,549,415	.0106	34.2	255.8
	Eastern	7,454,519	.0086	29.6	866.6
	Southern	2,280,873	.0083	30.1	611.3
PRODUCTS OF FORESTS					
United States	United States	33,542,661	0.0092	25.9	375.5
Eastern	Eastern	3,722,196	.0140	22.0	279.7
	Southern	205,608	.0134	18.1	540.0
	Western	214,081	.0123	23.8	530.1
Southern	Southern	2,850,411	.0119	26.7	139.8
	Eastern	5,329,350	.0090	24.4	752.7
	Western	630,558	.0088	23.5	813.3
Western	Western	11,236,266	.0090	27.6	305.4
	Eastern	8,022,352	.0068	26.8	1055.9
	Southern	1,331,839	.0071	28.2	462.5
MANUFACTURES AND MISCELLANEOUS					
United States	United States	93,231,896	0.0129	23.9	418.6
Eastern	Eastern	31,316,033	.0142	24.1	284.4
	Southern	5,886,356	.0131	21.7	673.4
	Western	15,809,158	.0122	20.7	1178.1
Southern	Southern	5,118,328	.0155	24.4	230.7
	Eastern	5,976,752	.0107	22.8	663.2
	Western	3,102,895	.0123	23.8	958.5
Western	Western	16,503,374	.0135	26.9	347.0
	Eastern	7,377,190	.0096	26.3	829.9
	Southern	1,871,810	.0114	26.6	451.4

interest to students of location is the status of freight rate structures both within and between the freight rate territories and the effects which these have upon the costs at which producers can assemble their raw materials and distribute their products.

The data in table 1 have been compiled from the Federal Coordinator's freight traffic report.[37] The exercise of a great deal of caution in interpreting them is necessary. They refer to railroad freight traffic terminated on one day only, December 13, 1933. *Revenues* per ton-mile are *not* to be confused with ton-mile *rates*. At most, they are very crude indications of prevailing freight rates, for there are significant differences in the lengths of haul and in the composition of traffic within and between the various regions examined. Some of the difficulties resulting from differences in the composition of traffic have been eliminated by separating less-than-carload from carload traffic and dividing the latter into 5 major groups, but by no means all of the diversity in traffic composition has been removed thereby. Nor would a more detailed analysis of the Coordinator's data resolve all of the difficulties on this score. For example, manufactured goods were divided by him into only 11 groups, 1 of them containing all the products of the iron and steel industry, another entitled Miscellaneous. The data are presented, not because they are completely satisfactory, but because they are the most nearly comprehensive available.

Even when the above limitations of the data are considered, one conclusion seems inevitable: The great regional differences in manufacturing activity that exist in this country cannot be attributed solely or even largely to differences in regional or interregional railroad freight rates on manufactured goods; this is not to deny, of course, that railroad freight rates on certain manufactures may favor producers in one area over another.

Differences are apparent between the ton-mile revenues on manufactures moving from eastern to southern territory and those moving in the opposite direction. Despite a shorter average haul, the ton-mile receipts on the north-bound business were 18 percent less than those for the south-bound business. Similarly, manufactures and miscellaneous commodities moving from the east to the west produced ton-mile revenues 27 percent higher than those moving from the west to the east despite a longer average haul. These differences may in part be accounted for by the higher stage of manufacture of goods moving from eastern territory. There is, however, no evidence from these figures that manufactures of the south and west are inhibited in reaching eastern markets.

[37] Appendix I, exhibit 221, sections 1–27, pp. 120–146.

The data show no striking advantage, in intraregional freight rates on manufactures, for any one of the territories over the other two. Revenues per ton-mile were 9 percent less in the East than in the South and 5 percent more than in the West. But the average haul in the East was 24 percent greater than in the South and 22 percent less than in the West.

No clear-cut advantage in rates on materials for any of the territories is evident for any of the three areas. Intraterritorial receipts per ton-mile were substantially lower in the East than in the other two areas only for products of agriculture. Intraterritorial ton-mile revenues from products of forests and from animals and animal products were lower in the West than in either of the other two areas. For products of mines, intraregional ton-mile receipts were substantially lower in the South than in the other two areas. Ton-mile receipts from products of agriculture were lower within the East than from the East to the West, although the average haul in the former instance was 150 percent longer than in the latter. On products of mines, ton-mile receipts were longer within the East than from the East to the South, although the average haul was 74 percent on the latter traffic. It would be hazardous to draw from these data inferences concerning the relative rates on materials paid by manufacturers in the various areas. Lack of knowledge of the composition of the traffic in each instance vitiates the value of any generalizations that might be made.

Even if a uniform rate structure existed through out the country, a large degree of concentration of manufacturing in the East, to serve the large consuming market located there, would be favored by relatively low rates on materials in comparison to those on manufactured products. But the relationship between rates on materials by the truck and by railroads competing the large consuming market in the East, nor does it explain the large amount of manufactures produced there for sale in other parts of the country.

Very little can be said about regional differences, if any, in motor carrier rates. Class rate structures have been approved by the Interstate Commerce Commission only for rate-making territories included in the northeastern region. Insofar as these structures tend to approximate rail rate structures, it is possible that relationships similar to those existing in the railroad field may develop in the future. No data are available for comparisons of interterritorial rates except rates over particular routes for particular products.

Probably the chief effect of the motor carrier on regional manufacturing development has been to reduce the attraction of major consuming markets for the location of manufacturing. As a result of the relatively larger reductions in rates on manufactures than

on materials by the truck and by railroads competing with trucks, it is more advantageous than formerly to undertake manufacturing near the sources of materials.

Effects of Public Policy on Location With Respect to Geographical Prices

The two most notable attempts made by the Federal Government to influence nontransportation prices relate to bituminous coal and to certain agricultural products. Direct regulation of the prices of the first commodity has been established, while regulation of the prices of agricultural commodities has been roughly achieved, indirectly. Both cases are significant from the standpoint of location; one, because transportation rates have received major consideration in setting prices, the other, because they have been ignored.

Under the Bituminous Coal Act of 1937, the Director of the Bituminous Coal Division has established a most complex set of minimum prices, f. o. b. mine, for bituminous coal.[38] Minimum prices at a single mine are made to vary according to market, with very little reference to differences in the transportation expenses involved in reaching various markets. They vary also according to the use to which the coal is to be put; thus prices for the same grade of coal differ according to whether it is purchased for domestic, commercial, metallurgical, bunker fuel, or byproduct purposes.[39] They differ also with the kind of transportation agency used in hauling it to market. Although nominally the minimum prices that have been established are set on an f. o. b. mine basis, actually they appear to be delivered prices and have many of the characteristics of prices under the basing-point systems used in steel, cement, and other industries. Competition through cutting under the minimum prices established is prohibited, while a great deal of discretion is allowed coal producers in "absorbing" freight in order to "meet" prices in distant markets. In effect, then, much of our discussion above with reference to the effects of changes in transportation rates upon location when the product concerned is sold under various "freight equalization" schemes applies here also.

In general[40] an effort seems to have been made to fix delivered prices on coal hauled by truck and by river carrier by adding the railroad freight charge to the f. o. b. mine price. The effect is to set minimum rates for truck and water carriers, and for shippers hauling coal in their own trucks or boats. Of perhaps greater importance, industrial purchasers who are favorably located with reference to cheap river and truck transportation, have been deprived of that advantage by the price structure established. It should be noted, however, that this does not apply to the so-called captive mines owned by important coal consuming industries. Moreover, the advantage in mine price accruing to mines located favorably with respect to cheaper transport may increase their profits and enhance their growth.

While the Act is still too recent to permit of final evaluation, a few recent cases seem to indicate that the Bituminous Coal Division will continue to act in such a way as partially to offset the effects of reductions in transportation costs upon the location of coal mining activity and of industries using coal. A temporary order was issued providing that a premium of not less than 80 cents per ton be added to the minimum mine price by producers shipping in their own trucks to Johnstown, Tenn., and its environs, regardless of their actual trucking costs.[41] Of perhaps greater significance was the temporary order issued by the Director by which the minimum mine price for three mines on shipments to Chattanooga, Tenn., was increased by 23 cents per ton.[42] The occasion for this increase was a reduction of 23 cents per ton in the railroad charge from the three mines in Chattanooga, ordered by the Interstate Commerce Commission, while rates from other mines serving the same city were not changed. In effect, the Director offset the action of the Interstate Commerce Commission and established a minimum rate for the railroad on the traffic concerned.

The corn-loan policy of the Department of Agriculture, by neglecting freight rate differentials from the various corn producing areas, seems to have offset the effect of the transportation rate structure upon the location of hog production. Corn is used principally as feed for hogs. Under the corn-loan program, farmers were given the alternatives of feeding corn directly, selling it, or storing it under Government loan. The Government loan price was made uniform throughout the country, although the net farm price had previously varied inversely with the distance freightwise of producers from market. At the same time, of course, freight charges on hogs to eastern markets continued to be greater the farther west they were produced. Corn was, therefore, placed under seal in the western corn belt, while it was fed to pigs in increasing amounts in the eastern corn belt. Production of hogs in Iowa and in States to the west has decreased greatly since the corn-loan program was put

[38] *Findings of Fact, Conclusions of Law and Order of the Director of the Bituminous Coal Division in General Docket No. 15*, U. S. Department of the Interior, Bituminous Coal Division, 1940.

[39] *Ibid.*, Findings, 38–40.

[40] There are numerous exceptions. (Cf. *Ibid.*, Findings 34 and W–11.)

[41] Department of the Interior, Bituminous Coal Division Release, December 19, 1940.

[42] Bituminous Coal Division, Docket No. A–12, Transcript of Evidence, p. 18.

into effect, while production in Ohio and Indiana has increased.[43]

Influence of Passenger Transportation on Location

Consumers frequently travel to obtain goods and services which they require. It has been estimated that 9.4 percent of total consumer expenditures in 1935–36 were for travel.[44] The prosperity of vacation centers is very largely dependent on convenient and cheap transportation. The motor vehicle and improved roads have redounded to the advantage of certain sections of the country, northern New England for example, as recreation areas, but some other once-prosperous resorts have suffered as a result.

Urbanization of industry is, in general, promoted by the great differences which exist in the quality of passenger service furnished various communities. Air transportation, for example, is available only to the largest centers. Faster passenger-train schedules often ignore smaller centers, which are bypassed. On the other hand, service differences among nearby communities have been largely eliminated as a result of individual ownership of motorcars.

The motor vehicle and the improved highway have apparently caused very small villages to lose much of their economic usefulness as trading centers. In this connection, the passenger automobile has probably been quite as important as the motortruck. An investigation made in 1932 disclosed that in the west midcontinent, "the present trend of retail furniture trade is toward the larger cities" and that "towns of less than 7,500 people are relatively less important in furniture distribution than in other lines of retailing. Until perhaps five or eight years ago, towns as small as 2,500 people seem to have been able to sell their proportionate share of furniture."[45] A recent survey discloses that about 10 percent of all passenger cars are used for shopping from 8 to 18 miles from home and that about 7 percent of them go more than 30 miles from home.[46]

Locational Considerations and Public Transportation Policy

Any action by government that influences the charges made and the quality of service given by carriers, or the costs to shippers or travelers of operating their own vehicles is very likely to affect also the relative advantages of various locations for production. Such policy may be effected by controls over construction, improvement, and maintenance of facilities or by regulation of entry and exit from business, of the issue of securities, of consolidation, and of rates.

Past and Present Policies

The history of public promotion of transportation is replete with evidence that the anticipated effects upon various regions and localities have weighed very heavily with officials responsible for formulating and executing policy. State and local activity in the early days of railroads and canals was largely directed toward the competitive interests of producers and merchants in the communities concerned. More recently, construction and improvement of highways and airports by State and local governments have been conditioned by similar considerations. The influence that indivduals and groups interested in the economic development of various regions of the country brought to bear upon Congress concerning subsidies to railroads in the fifties, sixties, and seventies is a story too well known to bear repeating. Proposals for the improvement of navigable rivers and for the construction of canals and harbors usually divide Congressional opinion along sectional lines. Numerous examples can be cited of rate regulation by States in order to foster certain economic interests within their borders. One of the most frequently cited instances was the attempt by the Texas Railroad Commission to develop trading centers within that State at the expense of Shreveport, La., by depressing intrastate railroad rates within Texas below the level of interstate rates.[47] The same Commission also attempted to encourage the location of flour mills within Texas by forcing railroads to set lower rates on wheat than on flour hauled into that State.[48]

The Interstate Commerce Act of 1887 resulted in part from complaints in the Midwest that railroads were discriminating unjustly in rate making. Various amendments to that Act since 1887 have been hotly opposed by certain sectional interests and just as ardently favored by others. One of the most heated sectional controversies in the halls of Congress has concerned the so-called long-and-short-haul rate problem.[49] The Hoch-Smith Resolution of 1925 was vigorously sponsored

[43] Cf. T. W. Schultz and O. H. Brownlee, "Our Iowa Corn Granary," *The Iowa Farm Economist*, January, 1941, p. 8. Recently, differential loan prices have been established which make some allowances for differences in transportation charges from various sources of supply.

[44] Cf. National Resources Committee, *Consumer Expenditures in the United States*, Washington, D. C., 1939, table 7A, pp. 79.

[45] Walter Mitchell, Jr., *Furniture Distribution in the West Midcontinent*, U. S. Bureau of Foreign and Domestic Commerce, Domestic Commerce Series No. 68, 1932, p. 16.

[46] Automobile Manufacturers Association, *A Factual Survey of Automobile Usage*, Detroit, 1941, p. 30.

[47] *Houston E. & W. Texas Railway Co. v. U. S.*, 234 U. S. 342 (1914). 1914.

[48] L. G. McPherson, *Railroad Freight Rates in Relation to the Industry and Commerce of the United States*, New York, 1909, p. 326.

[49] Ralph Dewey, *The Long and Short Haul Principle of Rate Regulation*, Ohio State University Press, Columbus, 1935

by various agricultural organizations and by Congressmen from agricultural areas.[50]

The Interstate Commerce Commission has repeatedly held that "It is impossible to consider the relative advantages and disadvantages under which a particular industry operates in various sections of the country as controlling what will be the fair and just relation which the law requires, or to offset disadvantages at one point against advantages at another." [51] It also holds that it is not its function to establish rates so as to offset disadvantages of location arising out of varying distances of competing producers from their markets.[52]

While the Commission has, in general, been careful to avoid any semblance of partiality to one section of the country to the disadvantage of another, not all of its decisions have been free of indications of sectional bias. As one writer has said, "It is easy for the Commission, in its general pronouncements, to declare repeatedly that it is not concerned with so adjusting rates as to equalize opportunities, and then, in its subsidiary declarations and in its disposition of proceedings, to find actual merit in various aspects of commercial equalization." [53] Its decisions are frequently rendered after hearing the conflicting claims of shippers interested in securing favorable treatment for various parts of the country; to quote Commissioner Eastman, "It is not easy to decide the case without being influenced by emotional reactions, one way or the other, which should play no part in the decision." [54] In the *Lake Cargo Coal Rates Case* of 1927, a minority of its membership accused it of being unduly swayed by sectional consideration.[55] The Commission's decision in a later case on the same matter was overruled by a Federal court, which held "It is perfectly evident * * * that * * * the Commission based its action upon the shift of tonnage from the northern to the southern field and the industrial conditions resulting therefrom." [56] Indeed, one writer contends that "In the last analysis, the question of relative rates to or from competing localities is less a question of conformity between the practice of transportation companies and a rule of justice than a problem of economic statesmanship relating to the location of industry and to the selection of concentrating and distributing points for the products of factory, mine, and farm.[57]

Consideration of Effects

Public transportation policy can be intelligently formulated and executed only if its effects upon the location of economic activity are considered along with other significant matters. The existing geographical distribution of productive activity cannot be considered an independent variable in decisions to construct or to improve highways, canals, airports, harbors, and navigable waterways. Not only present needs, but future traffic as well must be considered in estimating future gains to producers from such developments and in evaluating them against the costs involved. Similar "forward-looking" rather than "backward-looking" considerations should be made with reference to other transportation policies. The Interstate Commerce Commission, for example, frequently denies a certificate of convenience and necessity for a new common carrier motor-truck operation on the ground that present needs are adequately supplied by existing agencies, in spite of the contention of the petitioner that he can and will offer service at rates that are lower than those already prevailing. But, in that event, the attractiveness of the area served for the location of productive activity should be enhanced and the traffic requirements of the area increased. Determination of the fact of rate discrimination between particular communities depends, among other things, on prior determination that the complaining producers will be better able to market their product in competition with rivals situated elsewhere if the rate relationship is revised.

In considering locational effects it is not sufficient to know that an increase in the level of transportation rates will cause a tendency toward decentralization of productive activity. It is necessary also to know how much relocation will occur as a result, for a rise in rates will cause a diminution in net revenues only if traffic falls off sufficiently to reduce gross revenues and reduce them by more than costs are decreased. In order to know how much relocation of productive activity will result from a rise in the level of transportation rates, the Commission requires knowledge of such matters as the relative production costs for specific commodities at various locations, the ability of producers, their suppliers or employers at existing locations to absorb an increase in rates, the geographical pricing policies of various industries and, in the case of bituminous coal, the reactions of the Bituminous Coal Division to such a change in rates.

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[50] W. H. Wagner, *The Hoch-Smith Resolution*, Washington, 1929.

[51] *Cotton, Woolen and Knitting Factory Products*, 211 I. C. C. 692, 786 (1937). Also *State of Alabama et al.* v. *New York Central Railroad Co. et al*, 235 I. C. C. 255, 320 (1939).

[52] Cf. *Baltimore Chamber of Commerce* v. *Baltimore and Ohio R. R. Co.*, 22 I. C. C. 596, 603, (1912).

[53] I. L. Sharfman, *The Interstate Commerce Commission*, part III-B 1936, pp. 686–7.

[54] *State of Alabama et al.* v. *New York Central Railroad Co. et al.*, 235 I. C. C. 255, 333 (1939).

[55] 126 I. C. C. 309, 390–391 (1927).

[56] *Anchar Coal Co.* v. *U. S.*, 25 Fed. (2d) 462, 470 (1928).

[57] Stuart Daggett, *Principles of Inland Transportation*, 3d ed., p. 449, New York, Harpers, 1941.

Use of Transportation as a Tool for Implementing Locational Policy

There are serious limitations to the amount of locational change that can be effected by appropriate changes in transportation rates and services, although, abstractly considered, almost any desired distribution of population and of productive activity could be achieved by such means. Of perhaps greatest importance is the costliness of providing transportation. There are very practical limits to reductions in transportation charges and improvements in service. Even if subsidized at public expense, alternative uses to which the resources thereby devoted to transportation might be put would have to be sacrificed. Moreover, there still remain technical limits to the quality of the service that may be offered; time, for example, has not been entirely eliminated in transportation.

The existing geographical distribution of natural resources and of people exercises a very strong limitation on locational change. Changes, however drastic, in the rate structure and in the quality of the service rendered be carriers cannot create a raw material economy in an area devoid of mineral and metal resources and unfit for agricultural purposes—although some agricultural and mining regions may be made to prosper relatively to others. Reductions in freight transportation costs cannot provide a locality with low-wage labor or with labor of the requisite skill for a particular kind of productive enterprise—though they may offset, to some extent, the productive disadvantages entailed in operations with unskilled or high-wage workers. The mobility of skilled and of low-wage workers may be increased by reductions in passenger transportation rates, but actual travel expense is probably the least important cost of migration.

The fact that many industries would now be operated more profitably had they been otherwise located does not necessarily signify that they should be relocated, by transportation or any other means. Investments in productive facilities, including those for transportation, are usually made for more or less long periods in the future, and, once made, are moved to other locations only at significant expense. At any particular time, the locational pattern will appear to be such as to yield the best combination of the human and the material resources of the country only accidentally, if at all. The conclusion that perhaps 90 percent of all industries in the United States were then uneconomically located was reached after an investigation of the geographical distribution of industry made in 1927–28.[58]

[58] *Industrial Development in the United States and Canada.* Metropolitan Life Insurance Co. in cooperation with the National Electric Light Association, New York, 1928.

Failure of prices to reflect precisely changes in transportation rates is a significant limitation on any attempt to influence location by public transportation policy. An effort to relocate manufacturing through appropriate reductions in transportation rates on materials, for example, will be unsuccessful unless producers of such materials lower their delivered prices. It follows that efforts to influence the locational pattern by means of transportation will have greater chance for success if at the same time the geographical pricing policies of producers are made to reflect changes in transportation costs and if governmental price-fixing agencies, like the Bituminous Coal Division, cooperate to that end.

There are formidable legal obstacles, also, to effecting changes in the locational pattern by changes in the rate structure and in the quality of service rendered by carriers. If all carriers were publicly owned,[59] the possibility of using transportation to bring about locational shifts would be much greater than under a system of private ownership. Even under public regulation, private owners are (rightly) protected by constitutional safeguards from arbitrary manipulation of transportation rates and service by public bodies. The fact that a large and growing amount of transportation, both freight and passenger, is conducted by producers and travelers in their own vehicles and is therefore subject to only a minor degree of public control still further restricts the scope within which public transportation policy can operate to effectuate locational change. A further limiting institutional force is the fact that public control of transportation is, itself, not centralized but divided between Federal, State, and local bodies. This is true both for the construction and improvement of transportation facilities and for the regulation of carriers. Even within the Federal Government itself, transportation policy is administered by a number of agencies.

Despite the above limitations, there is no question that a good deal of locational change may be effected by appropriate transportation policy. In succeeding chapters of this report, it is shown that a great many economies may be achieved by efficient organization, coordination and management of transportation undertakings by public and private bodies alike. It is also indicated that the regulation of transportation rates can be greatly improved.

A lower level of intraregional rates would undoubtedly foster a greater amount of trade between various sections of the favored region, and an increase in the

[59] It is not intended to urge public ownership of all carriers, or restrictions upon the operations of their own vehicles by producers, or centralization of transportation in one agency. These matters involve many other considerations (discussed in other sections of this report) than those relating to location alone.

amount of economic activity carried on there. Changes in the structures of intraregional and interregional rates would also influence the amounts of various kinds of productive activity carried on in particular regions. A region could, for example, be made more attractive for manufacturing enterprise if rates on raw materials produced there and transported to other parts of the country were raised while transportation charges on manufactures hauled to other regions were lowered. Its attractiveness for manufacturing would be enhanced if, at the same time, rates on raw materials from other areas to it were reduced, while manufactured goods from the outside were forced to bear higher charges.

Elimination of the advantages in transportation rates enjoyed by large urban concentrations and their immediate surroundings would undoubtedly reduce their attractiveness for production and trade. The suggestion has frequently been made that the advantages of large cities would be reduced if rates were placed on a distance basis. The size of urban concentrations would be even more effectively reduced if all places within a certain radius of them, the length of the radius depending on the length of the haul, were grouped and total transportation charges between them and outlying points made the same. The trend of industry and population to the suburbs of large cities would, of course, be furthered by this means.

Even if the rate advantages possessed by large cities were eliminated, they would continue to have significant advantages in transportation service over smaller centers, especially in the frequency and convenience of schedules. But a reduction in the size of large cities, consequent upon elimination of their rate advantages, would in all probability result also in a decline in the quality of transportation service afforded them.

At least one kind of change outside the transportation area, which apparently results in undesirable locational shifts, might well be offset by appropriate changes in transportation rates. There is little doubt that failure of rates to fall during periods of generally declining prices throughout the economy—indeed their tendency to advance in order to take advantage of the short-run inelasticity of demand for transportation service—causes contraction of the market areas of producers who normally sell at a distance. On the other hand, failure of rates to rise along with other prices during periods of business revival has just the opposite effect. There seems to be little social advantage—rather, significant social disadvantage—in such periodic locational shifts. There is no doubt that substantially the same total profit from transportation enterprise could be achieved if higher rates and greater profits were permitted during periods of business prosperity and lower rates and profits during recessions. In this way, geographical shifts in the relative intensity of productive activity during the course of a business cycle might be reduced.

The most defensible changes in rates and service, from both the social and legal points of view, are those that would bring rates more closely in line with costs and would accordingly limit the quality of the service afforded producers to their ability to defray the costs of rendering it. There is danger that emphasis upon its locational effects may obscure the fact that the efficiency with which transportation is conducted and the manner in which costs are allocated among the users of transportation exercise a significant influence, also, upon the organization of the economy as a whole, the efficiency with which it is operated, and so upon the total amount of goods and services available for distribution among the Nation's inhabitants.

Unfortunately our knowledge of transportation costs is very inadequate. In a recent case involving interterritorial rates between the southeast and the northeast, there were serious differences of opinion concerning the relative costs of railroad transportation in the two areas. Southern producers maintained that costs within the south were no higher than in the north. Representatives of the northern railroads agreed with them, while the contention was very vigorously denied by representatives of the southern roads.[60] In a dissenting opinion in that case, Commissioner Eastman stated, "On the basis of the statistical information now available, I doubt whether the relative cost of transporting particular commodities between the south and the north, as compared with the cost of transporting them within the north, can satisfactorily be determined. Attempts so far made have used as measures alleged comparative and average costs of transporting all freight within each territory. The trouble with this is that the comparison is of unlike things, for the average composition of all freight is very different in the two territories and the average conditions under which it moves, such as load and tare weight per car and length of haul are also very different. As yet no one has been able to make satisfactory allowances for those differences."[61] Similar lack of knowledge exists with respect to the relative costs of highway transportation in the various parts of the country.

Without knowledge of transportation costs, it is impossible to determine whether existing intraregional and interregional rate levels are too high, or whether differences in rates on goods of varying degrees of fabrication are warranted by differences in the costs of transporting them. Even if all carriers were publicly owned

[60] *State of Alabama et al., v. New York Central Railroad Co., et al.*, 235 I. C. C. 255, 310, 313, and 316 (1939).

[61] *Ibid.*, p. 345.

such knowledge of costs would be just and desirable. If the advisability of subsidizing productive activity in a particular region were established, for example, there would still remain the question of the appropriateness of alternative ways by which such subsidy might be given. An important factor in determining this matter would be the relative costs involved in employing transportation and other means.

In the opinion of the writer, the weightiest objection to the regulation of transportation by government for the effectuation of locational objectives is the tremendous administrative difficulty that would be encountered. Administration of public transportation policy is, necessarily, largely of a piecemeal variety. It involves decisions concerning the justification of the construction or maintenance of small stretches of highway or waterway, or of individual rate changes affecting immediately only very small segments of the economy, and so on. This kind of day-to-day administration of public policy on transportation matters is sufficiently complicated without adding locational goals to the criteria that must now be taken into consideration. Certainly, a much greater amount of knowledge will be required of public officials administering it, if transportation policy is to be used systematically and on a continuous basis for locational ends.

If relocation of population and industry—the economic development of a particular region, for example—should be considered as overwhelmingly in the public interest, transportation might well be used, along with other forces, such as power development and vocational education, for that purpose. But, in that event, the subsidy thus given to the producers of the region should be recognized for what it is and not concealed in the form of hidden taxes on other users of transportation service.

PART I—SECTION III
FREIGHT RATES AND RELATED PROBLEMS
1. RATES AND RATE STRUCTURE

By D. Philip Locklin [1]

RATE CHARACTERISTICS AND RATE-MAKING POLICIES

In order to understand current issues in the field of transportation rates, a knowledge of some of the characteristic features of freight rates and of the principles on which they have been constructed is required.

Railroad Rates

Description

Freight classification.—A freight classification, the first step in rate making, is simply a grouping into a limited number of groups or classes of the thousands of articles which the railroads may be called upon to carry, so that rates can be quoted on this limited number of groups instead of upon each commodity separately. Consolidated Freight Classification No. 13, which became effective June 5, 1939 (recently superseded by Consolidated Classification No. 14), placed ratings on approximately 7,800 different articles or groups of articles. The number of actual ratings exceeded this number, since for most articles several ratings were provided, depending upon the method of packing, the type of container, and whether in carload or less-than-carload lots.

Three major freight classifications have been developed by the railroads, namely, the Official, the Southern, and the Western. The Official Classification is applicable in the area east of a line running from Chicago to Peoria, thence down the Illinois River to St. Louis, and down the Mississippi River to its junction with the Ohio River, and north of the Ohio River and of the line of the Norfolk and Western Railroad from Kenova, W. Va., to Norfolk, Va. Southern Classification applies in the area south of Official Classification Territory and east of the Mississippi River. The Western Classification applies west of Official and Southern Classification Territories. There is some overlapping of the classification territories. Certain border points may be considered in two territories, since traffic to and from these points may take one classification or another depending upon the direction of movement. Illinois, which is split by the boundary between Official and Western Classification, has a classification of its own known as the Illinois Classification which applies throughout the State, including some points outside but near the State boundaries.

Traffic moving from one classification territory to another is governed by a single classification if a through rate is quoted from point of origin to destination. The freight tariff giving the rate specifies which classification is applicable. When no through rates are quoted and the traffic moves on a combination of rates to and from border-line points, each "factor" in the combination rate is governed by the appropriate classification; hence the shipment will move under two or more classifications.

The number of classes, class designations, and the relationships between the rates on the different classes differ. In Official Classification there are eight classes, designated as 1, 2, R25 (rule 25), 3, R26, 4, 5, and 6. Rule 25 and rule 26 classes are classes which were inserted between classes 2 and 3, and between 3 and 4, respectively. Rule 25 rates were made 15 percent less than class 2, and rule 26 rates 20 percent less than class 3. As a result of the decision of the Interstate Commerce Commission in Eastern Class Rate Investigation,[2] rule 25 was merged with class 3. In the Southern Classification there are 12 classes, numbered from 1 to 12, although classes 7, 8, 9, and 10 are also known as class B, A, C, and D, respectively. In Western Classification there are 10 classes, 5 numbered classes—1 to 5—and 5 lettered classes—A to E. In addition to the regular classes, there are, in all classifications, multiples of first class, as follows: 1¼, 1½, 1¾, D1 (double first class), 2½ t 1 (2½ times first class), 3 t 1, 3½ t 1, and 4 t 1. There are also some articles in the classification which are given a rating of a certain percent of the first-class rate, for example, 37½ is a common rating in Official Classification.

The relationship between first-class rates and other rates has been generally standardized in recent years in connection with the important class-rate revisions.

The relationships in the rates on the various classes are shown in the three accompanying tabulations.

[1] Professor of Economics, University of Illinois, and Consultant, National Resources Planning Board. The author has been assisted in the preparation of this section by Miss Marion W. Worthing, Economist, National Resources Planning Board.

[2] 164 I. C. C. 314, 378–379 (1930).

Official Classification Territory

Class	Percent of first-class rate
1	100
2	85
3, Rule 25	70
Rule 26	55
4	50
5	35
6	27½

Southern Classification Territory

Class	Percent of first class
1	100
2	85
3	70
4	55
5	45
6	40
7 or B	35
8 or A	30
9 or C	25
10 or D	22½
11	20
12	17½

Western Classification Territory

Class	Percent of first class
1	100
2	85
3	70
4	55
A	45
5	37½
B	32½
C	30
D	22½
E	17½

Prior to 1919 the three classifications were published in separate volumes. In 1919 they were combined in a single volume, known as the Consolidated Freight Classification. Publication in one volume required uniformity in the arrangement and description of the articles, but the Consolidated Classification is not a uniform classification since the distinctive ratings in the three classifications remain.

The existence of regional classifications applicable over extensive areas gives the appearance of uniformity in ratings throughout a particular territory. Numerous "Exceptions to the Classification" are published, however, by means of which individual lines or groups of lines may make such deviations from the regular classification ratings as they find expedient.

Not all rates are quoted through the preliminary step of assigning them to "classes" and quoting rates on the various classes. Many commodities, particularly those which move in large volume, have rates quoted on them directly. These are known as "commodity rates." Commodity rates may apply only between a limited number of points with the regular class rates applying elsewhere, or they may be so extensive as to cover all the principal movements of a particular commodity. Grain, lumber, coal, and many other products almost always move under commodity rates. There seem to be no figures available showing the percentage of the total tonnage which moves under class rates and commodity rates, respectively. However, in Western Territory it was estimated that in 1926 only 2.4 percent of the tonnage moved under class rates.[3] In Southern Territory it was estimated that in 1924 the railroads received about 16.5 percent of their freight revenue from traffic moving on class rates.[4] It seems clear that by far the larger proportion of the freight tonnage moves under commodity rates, and that the commodity-rate traffic also furnishes the larger amount of freight revenue.

In recent years there has been a tendency to quote on many commodities so-called "column rates" bearing a definite percentage relationship to first-class rates. The device may be illustrated by the action of the Interstate Commerce Commission in *Western Trunk-Line Class Rates* wherein the carriers were required, in publishing tables of class rates, to set up 23 percentage columns. Class I rates, of course, were column 100 rates. The other columns were to be 92.5, 85, 77.5, 70, 65, 60, 55, 50, 45, 37.5, 35, 32.5, 30, 27.5, 25, 22.5, 20, 17.5, 16, 14.5, and 13 percent, respectively, of the column 100 rates.[5] Ten of the 23 percentage columns corresponded to the 10 classes of freight recognized by the Western Classification.

Column rates may be considered as commodity rates which have been definitely tied to the class-rate structure by making them a certain percentage of the first-class rates. They may also be considered, in effect, as an expansion of the freight classification which creates many more "classes" of freight, and which enables many commodity rates to be brought within the classification scheme. Not all commodity rates, however, are related to the class rates in this way.

Freight tariffs.—The freight classifications do not show rates but only the groups or classes to which the traffic is assigned. Rates on the various classes of traffic, and on the commodities which move under commodity rates, are published in tariffs. These may be class tariffs, general commodity tariffs, class and commodity tariffs, or special commodity tariffs giving rates only on a particular commodity. Tariffs may be single-line tariffs or joint-line tariffs. In the latter case, they are frequently published by tariff-publishing agents of the carriers. The staff of the Federal Coordinator of Transportation pointed out in 1935 that there were currently on file with the Interstate Commerce Commission about 500,000 tariffs and supplements, containing about 2½ million pages.[6] "Present-day tariffs," says the report, "are the most technical and complicated documents extant."[7] The carriers have been criticized severely on this score, although it is extremely difficult to remedy the situation as long as there are so many different carriers and routes and so many elaborate and complicated rate structures. Efforts are being made

[3] Dissenting Opinion of Commissioner Porter in *Western Trunk-Line Class Rates*, 164 I. C. C. 1, 232 (1930).

[4] *Southern Class Rate Investigation*, 100 I. C. C. 513, 533 (1925).

[5] 164 I. C. C. E. 194–195 (1930).

[6] *Freight Traffic Report*, vol. I, p. 71.

[7] *Ibid.*

by various shipper and carrier organizations to effect an improvement in this situation.

Class-rate structures.—Since 1925, the railroad class-rate structures in the principal rate territories and between rate territories have been before the Interstate Commerce Commission in comprehensive investigations which resulted in the prescription of new structures or in substantial revision of preexisting ones. The more important of these class-rate cases were *Southern Class Rate Investigation*,[8] *Eastern Class Rate Investigation*,[9] *Western Trunk-Line Class Rates*,[10] *Consolidated Southwestern Cases*,[11] *Western-Southern Class Rates*.[12]

The rate structures originally prescribed in most of these proceedings have been modified from time to time in detail, but the structures retain the general characteristics of those prescribed in the initial decisions.[13] At the present time the Commission has a general investigation of class rates under way. (No. 28300, *Class Rate Investigation, 1939.*) A detailed description of these rate structures is unnecessary here, but the general characteristics of them may be noted.

The structures are in general conformance with the distance principle, and distance scales of first-class rates have been generally prescribed by the Commission. The scales are constructed upon the "tapering principle," that is, the rates increase with distance but at a decreasing rate, thus resulting in lower rates per mile for the longer distances. The rates are graded upward by blocks of 5 miles for short distances, with blocks of increasing length as the distance increases.

Rates on other classes are made definite percentages of the first-class rates. As noted in the description of freight classifications the percentage relationships are uniform throughout the area for which the rates are prescribed. Column rates are also provided in addition to the regular numbered and lettered classes.

The rate scales are uniform for large areas, although not necessarily for the whole area covered by the investigation. In *Eastern Class Rate Investigation* two scales were provided for New England: A zone A scale for southern New England, and a zone B scale, 10 percent higher, for northern New England. Rate zones with difference scales were recognized in Central Freight Association Territory, and in Western Trunk-Line Territory. A uniform scale, however, was provided for the whole of Southern Territory, with the exception of the Florida Peninsula. The differences in scales are usually for the purpose of reflecting differing operating costs due to variations in operating conditions or in traffic density. Even when a uniform basic scale is prescribed for a whole territory, exceptions are commonly allowed which take the form of "arbitraries" for distances on branch lines, or on short and weak lines.

The method of computing distances is prescribed. Usually this is the shortest route between two points via which carload traffic can be interchanged without transfer of lading. Relief from the long-and-short-haul clause is granted circuitous routes, subject to certain restrictions and limitations, to meet the rates of the more direct routes. Some grouping of points of origin or destination, or both, is permitted, largely for the purpose of reducing the number of points between which separate rates are to be published. A certain amount of competitive equalization of rates may also be a factor in the establishment of such groups.

The Commission frequently prescribes specific rates between "key" points which differ from the rates which would result from a strict application of the distance scale prescribed. If these rates result in lower rates between the key points than apply to or from intermediate points which are not key points, the key-point rates are commonly recognized as maxima at the intermediate points in order to avoid violation of the long-and-short-haul clause. The specific key-point rates often represent a compromise with the preexisting rate structure or are for the purpose of preserving competitive adjustments which would be upset by a strict application of a distance scale. In some cases a sufficient number of key-point rates have been prescribed to obviate the necessity of setting a distance scale.[14]

The rate scales and key-point rates prescribed by the Commission are maximum rates. The carriers are permitted to publish lower rates where this seems to be desirable, provided, of course, they do not cause undue preference or prejudice.

Commodity rate structures.—Generalization about commodity-rate structures is difficult because of their wide diversity. A description of particular rate structures would be out of the question here, even if it were confined to the rate structures on the more important articles of commerce that move on commodity rates. Some commodity rates have been tied into the class-rate structure by the use of column rates, that is, by making the rates on the articles in question a certain percent of the first-class rates. Many of the important commodity-rate structures, however, are unrelated to the class-rate structure.

In general it may be said that the play of competitive forces, particularly the competition between rival producing points and areas and between rival markets, exerts more influence on the commodity-rate structure

[8] 100 I. C. C. 513 (1925), 109 I. C. C. 300 (1926), 113 I. C. C. 200 (1926), 128 I. C. C. 567 (1927).

[9] 164 I. C. C. 314 (1930).

[10] 164 I. C. C. 1 (1939).

[11] 205 I. C. C. 601 (1934), 211 I. C. C. 575 (1935).

[12] 226 I. C. C. 497 (1938), 238 I. C. C. 681 (1940).

[13] Cases in which modifications of the class-rate structures are made are generally noted in the Annual Reports of the Commission.

[14] *Western-Southern Class Rates*, 226 I. C. C. 487 (1938).

than on the class-rate structure. Commodity-rate structures are commonly characterized by a great deal of grouping, particularly of producing points, as a result of competitive forces. They are also characterized by delicate differential rate adjustments, the result of compromise in the competitive struggle. Commodity-rate structures, therefore, are less frequently constructed on a purely distance basis.

Influence of overhead costs.—Before proceeding further in the description of railroad rates, mention should be made of overhead costs in the railroad industry and their effect upon rate making. Railroad costs may be divided into two classes—those which vary more or less in proportion to the volume of traffic carried and those which remain approximately the same regardless of the amount of traffic carried up to the full capacity of existing facilities. The former are often called variable, direct, or out-of-pocket expenses. The latter are often called constant, indirect, or overhead expenses. Important among the constant expenses is interest on bonds or return upon capital generally. Many operating expenses are constant in nature. For example, part of the expenditures for maintenance of way and equipment tend to be independent of the amount of traffic carried. Taxes and many general administrative expenses are to a large extent constant in nature.

The distinction between constant and variable expenses is not sharp. Over long periods of time most expenses become variable since the size of the plant can be adjusted in some degree to the volume of traffic. For shorter periods of time many expenses must be considered as constant which would become variable over a longer period. Furthermore, the additional or out-of pocket expense incurred in taking on additional traffic will vary with the size of the unit. If no additional car-miles of service are required, the additional expense is very little. If additional train-miles are required, the additional expense is greater than if the traffic can be carried by adding additional cars to existing trains.

From the earliest days of railroading the managers of railways have reasoned that traffic which will not move at "normal" rates is profitable at lower rates, so long as the direct or variable expenses incurred in transporting the traffic in question are covered and some contribution is made toward the constant or overhead expenses.[15] This policy of rate making has not gone unchallenged.[16] There can be no disputing the fact, however, that this principle has long dominated actual rate making. It accounts for the wide discrepancy often found between normal rates and competitive rates. It explains the tendency to quote low rates on "low-grade" traffic, i. e., traffic which will not move at all, or only in small amounts, unless especially low rates are provided. It also explains the disregard of distance in the construction of many rates and the practice of sometimes charging more for shorter than for longer hauls over the same line or route. The practice of adjusting rates to the exigencies of demand is sometimes called the value-of-service principle or charging what the traffic will bear.

Value of the commodity as a factor in rate making.—One of the most common manifestations of the value-of-service principle is the placing of high rates on valuable articles on the theory that the traffic will stand the high charges. Although it is not always true that valuable articles will stand high rates and the cheap articles will only move at low rates, there is usually a rough correspondence between the value of the commodity and the value of service of transporting it. This has often given rise to identifying the value-of-service principle of rate making with charging according to the value of the articles transported.

Cost of service as well as value of service is a factor in the determination of the rating of articles in the freight classification. It is, therefore, impossible to compare the ratings on different articles and say to what extent the variations reflect the value-of-service principle. The range between first-class rates and the rates on lower classes of freight indicates how widely the charges may vary on different commodities. Since there are multiple classes as high as 4 times first class, and since there are column rates as low as 13 percent of first class, rates of 4 times first class would be more than 30 times the column 13 rates. There are also numerous commodity rates which approximate 8 percent of first class, thus increasing further the spread between the highest and lowest rates. With such a wide range in possible rates, ample opportunity is given to make particular rates or ratings reflect differences in either costs of service or in value of service. It would certainly be impossible to explain all of the variations in rates in terms of differences in cost of service.

The rise of competing forms of transportation in recent years has threatened the ability of the railroads to continue the practice of charging high rates on valuable articles. Important modifications of the railroad rate structure in this respect are under way. The problem growing out of this situation is discussed below in connection with some of the recent issues in rate making.

Carload and less-than-carload rates.—As noted above, railroads commonly make a difference in the rates on carload and on less-than-carload shipments. Consoli-

[15] For further exposition of this principle see Hadley, A. T., *Railroad Transportation*, pp. 109–124, 261–265; Jones, Eliot, *Principles of Railway Transportation*, ch. IV; Daggett, Stuart, *Principles of Inland Transportation*, 3d ed., ch. XVI.

[16] See Clark, J. M., *Economics of Overhead Costs*, chs. XIII and XIV; Healy, Kent T., *The Economics of Transportation in America*, ch. XI.

dated Freight Classification No. 13, for example, provided in Official Territory, 5,552 carload ratings, 7,098 less-than-carload ratings, and 1,923 any-quantity ratings. Any-quantity ratings are those which make no distinction between carload and less-than-carload quantities. Commodity rates, as well as class rates, may differ on carload and on less-than-carload shipments, although the great majority of commodity rates are carload rates. There is no uniform spread between carload and less-than-carload rates. An analysis of Consolidated Freight Classification No. 13 shows spreads between less-than-carload and carload ratings as follows:

Official territory		Southern territory		Western territory	
Drop in number of classes L. C. L. to C. L.	Number of instances	Drop in number of classes L. C. L. to C. L.	Number of instances	Drop in number of classes L. C. L. to C. L.	Number of instances
0	[1] 38	0	69	0	18
1	629	1	487	1	580
2	1,871	2	2,249	2	2,484
3	1,659	3	1,666	3	2,054
4	458	4	918	4	724
5	114	5	275	5	238
6	1	6	112	6	58
-------	-------	7	50	7	19
-------	-------	8	42	8	4
-------	-------	9	3	9	2
-------	-------	10	1	-------	-------
-------	-------	11	1	-------	-------

[1] Excluding items given any-quantity ratings. Instances of carload ratings the same as less-than-carload ratings are equivalent to any-quantity ratings. When an article is given a carload and a less-than-carload rating in one classification territory, while another territory maintains an any-quantity rating, the classification description must provide for the article both in carloads, and in less-carloads, but in the territory maintaining any-quantity ratings, the same rating will be shown for carload as for less-than-carloads.

Since the rates on the lower classes bear a definite relation to first-class rates, the carload-class rates can be expressed as a percentage reduction from the corresponding less-than-carload rates. The following table shows what wide variations there are in the relation of carload class rates to the corresponding less-than-carload rate:

Percent decrease less-than-carload to carload class rates [1]	Number of instances		
	Official territory	Southern territory	Western territory
0	38	73	18
1–9	2	1	135
10–19	285	296	183
20–29	328	853	268
30–39	1,705	1,809	2,528
40–49	1,807	2,200	2,486
50–59	2,006	1,094	874
60–69	374	360	330
70–79	47	87	109
80–89	13	6	9
	6,605	6,779	6,940

[1] Ratings taken from Consolidated Classification No. 13. Spread in rates determined from standard percentage relationships of lower classes to first-class rates.

Although lower rates on carloads than on less-than-carloads have existed for many years, it has not been the practice to maintain lower rates on multiple-car lots or on trainloads than are provided for single carloads. Instances of rates of this nature were brought to light in some of the early cases before the Interstate Commerce Commission, but these rates did not meet with the Commission's approval. In recent years multiple-car rates have reappeared but are still a rarity.

On less-than-carload shipments the railroads have not, until recently, maintained rates that vary with the size of a particular shipment. Motor carriers, however, have sometimes provided rates of this nature and this has led to the adoption of the practice by railroads in some instances. This and other recent developments in rate making are discussed later in the report.

The Influence of Competition On Railroad Rates

It has been noted above that both class and commodity rate structures are affected by various competitive influences. If it were not for the influence of competitive forces, operating at some points and not at others, railroad rates would doubtless conform more closely to the distance principle. Rates varying with distance, although not necessarily in proportion to distance, are logical, since costs of transportation increase as the length of the haul increases. The chief effect of competition between carriers is to modify, if not to distort, the distance principle of rate making. Three distinct types of competition may be recognized as particularly significant in their effect upon the rate structure. These are competition of routes; market or commercial competition; and competition with other, and presumably cheaper,[17] transportation agencies.

Competition of routes.—Competition of routes is the competition of two or more railroads having common termini. This type of competition may be further subdivided into (*a*) the competition existing when the two routes are of approximately equal length, and (*b*) competition between a route which is circuitous, or which operates under some cost disadvantage, and a direct or low-cost route.

Competition between routes of approximately equal length tends, in the absence of regulatory controls, to reduce the rates at competing points to less than the full cost of the service. This is because the railroads, under the stress of competition, tend to ignore the constant or overhead expenses and quote rates on an out-of-pocket-cost basis, if need be, to obtain traffic from their rivals. The reduction of the competitive-point rates depletes the revenues of the railroads unless it is found possible to shift the burden to intermediate points

[17] The term "cheaper" is used here and in succeeding paragraphs in the sense of normally maintaining lower rates even if the lower rates are made possible by the assumption by the Government of part of the transportation costs such as results from Government provision and maintenance of waterways.

by raising the rates at such points above the level that would otherwise obtain. A further result of competition of this type is discrimination against intermediate points at which competition does not exist. This discrimination results from the lowering of the rates at the competitive points even if there is no attempt to raise rates at the intermediate points above a normal level.

When competition is between a circuitous route and a direct route the effect on the rate structure is more complex. Competition will, of course, tend to equalize the rates via the two routes irrespective of differences in distance. If the circuitous route is so long that its service is inferior it may be necessary for its rates to be lower than those applicable over the direct route. These are often known as differential routes. Between Chicago and New York, and between Chicago and Boston, differential routes have been maintained in conjunction with Canadian and New England roads by way of Montreal. These routes divert traffic from the shorter routes of the trunk-line railroads. When indirect routes meet the normal rates of the direct routes the competitive points cannot be said to be preferred. They do not get lower rates than they would get if they were served by the direct routes alone. But if the competition results in subnormal rates via the direct routes this type of competition creates unjustifiable discrimination. Even if equalization of rates over a circuitous route with those of a direct route creates no unfair discrimination, it may be objectionable because it results in wasteful transportation. The folly of transporting goods over circuitous routes which could be hauled at less cost via direct routes would be clear if the railroads were operated as a single system. The cost of this unnecessary transportation is borne by the general public through a higher rate level than would otherwise be necessary, or it is borne by railroad owners and investors through reduced profits in the railroad industry. Individual railroads, of course, may gain by this type of competition while others lose. Offsetting the economic waste resulting from circuitous route competition is the stimulus to good service which results from the participation of two or more routes in the traffic.

Market competition.—This type of competition exists when two or more railroads serving different producing points compete in the carrying of goods from rival producing points to a common market or when two or more railroads compete in carrying goods from a common producing area to rival markets. Group rates often result from this type of competition. The grouping of origin points places all producing points within the group upon an equality as far as freight rates are concerned.

Market competition sometimes results in granting particularly favorable rates to producing areas located at great distances from markets which are competing with nearby producing areas. It pervades the whole railroad rate structure, particularly the commodity-rate structure.

So far as freight rates are concerned, market competition has a tendency to equalize rates from rival producing areas and results in subnormal rates from the more distant points. It should not be inferred that rates are always equalized where market competition comes into play, but market competition usually operates in the direction of equalization. Where rates are not actually equalized there may be a system of differentials established in recognition of differences in distance, but these differentials are usually lower than differences in distance would justify. Equalization of rates, furthermore, may be unnecessary when the distant producers have some cost-of-production advantage over nearer producers which enables them to compete in the market in spite of a rate handicap.

Market competition has had certain definite economic consequences. In the first place, it exerts a profound influence upon the location of industries. It has the effect of encouraging the development of producing centers remote from markets at the expense of those which are closer. Thus, some producers are deprived of their advantage of location, and others are given an advantage to which their location does not entitle them. A secondary effect is that on the products of extractive industries equalization of rates regardless of differences in distance may result in a too hasty and wasteful exploitation of resources.[18]

Market competition also causes wasteful transportation. When rates are reduced from a distant source of supply to equalize them with rates from a nearer source unnecessary transportation takes place. It cannot be said that new traffic is created by the equalization; instead, the rival producing areas share the market, and some goods are brought from the farther producing areas when they could just as well have been produced nearby. The economic waste resulting from market competition increases when several producing areas are permitted to invade each other's natural markets. In such instances an enormous amount of cross-hauling may develop.

Market competition, like any other competition between railroads, may become ruinous in character. In its simpler forms it forces railroads from more distant sources of supply to meet the normal rates maintained

[18] Implied by Fetter in *The Masquerade of Monopoly*, p. 406; see also, Sharfman, I. L., *The Interstate Commerce Commission*, vol. III–B, p. 691; and *U. S. Coal Commission Report* (1925), pp. 252–253.

from nearer sources. But if a struggle ensues between the lines serving the rival producing points, even the rates from the nearer sources of supply may be depressed below a normal level. When this occurs market competition unnecessarily depletes the revenues of the railroads.

It is not, however, without offsetting advantages. It intensifies industrial competition and destroys the semi-monopoly position that a local producer may have when protected from outside competition by a distance system of rates. In reply to this argument it may be said that in some instances there are enough producers near the market to make the industry competitive. Furthermore, distant producers, if enjoying an advantage of low production costs, may be able to compete in a market even when paying higher freight rates.

We have pointed out that market competition generally deprives the nearby producer of his advantage of location and gives to a distant producer an advantage which he does not naturally possess. If the same railroad or railroads served the two producing areas, this might be found unlawful under section 3 of the Interstate Commerce Act, since it unduly prefers the distant source of supply and unduly prejudices the nearer source of supply; but if the distant producer is served by one carrier and the nearer producer by another, equalization of rates in disregard of distance is not unlawful under section 3, since a railroad cannot be held to discriminate against a point which it does not serve. Thus, a rate adjustment which would be unlawful if maintained by one railroad company serving different producing areas often becomes the usual adjustment when different sources of supply are served by different railways.

Competition of Railroads With Other Transportation Agencies

Competition of railroads with other forms of transportation has effects similar to competition between rail lines. The railroad rate structure is often affected by the competition of water carriers, motor carriers, and pipe lines. Competition of railroads with these other forms of transport can become destructive or "ruinous" in nature, i. e., it can result in rates that are below the full cost of service by the various competing carriers. More often, however, the effect of these competing transportation agencies on the railroad rate structure is to bring about whatever reduction in the rail rate below the normal or usual basis may be necessary to meet the competition of the lower cost agency. Since the railroads have a large mass of constant or overhead costs, while the costs of the other transportation agencies are more nearly variable in character, the railroad has the advantage in any competitive struggle for traffic.

Modification of the Effects of Competition As a Result of Rate Regulation

Regulation has modified the effects that competition tends to have on the railroad rate structure. This is true notwithstanding the fact that the right of a carrier to meet competition, or not to meet competition, is a firmly established principle, recognized by the courts as well as by the Interstate Commerce Commission.[19]

Although the railroads have been allowed great freedom in meeting competition of any kind there are certain recognized limitations to this right. These may be summarized as follows: (1) A railroad will not be permitted to reduce rates to less than the out-of-pocket cost of moving the traffic in question; (2) a carrier proposing to reduce rates to meet competition must do so without causing undue preference or prejudice; (3) rates which are reduced to meet competition may be no lower than necessary to meet the competition encountered. In addition to these limitations on the right of a railroad to adjust its rate to competitive situations it should be recognized that the Commission exercises a restraining influence in preventing reductions in rates which would be followed by retaliatory reductions by other lines and hence jeopardize a rate structure deemed to be on a reasonable basis.[20]

Preceding paragraphs should make it clear that competition between railroads, and between railroads and other forms of transport, has profoundly affected the rate structure of the country. This competition has both desirable and undesirable effects. The undesirable results have been greatly reduced by restrictions imposed by regulation. Some important questions of public policy, however, center about the extent to which competition between railroads, and between railroads and the other transportation agencies, should be restricted.

Motor Carrier Rates

Prior to the enactment of the Motor Carrier Act of 1935 interstate rates of motor carriers were constructed on many different bases, and in many cases were not published. Some States, however, had placed intrastate motor-carrier rates on a systematic basis and had required that rates and classifications be published.

Under the provisions of the Motor Carrier Act of 1935 it became necessary for common carriers by motor vehicle to publish tariffs containing their interstate rates and to file them with the Interstate Commerce Commission. The effect of this requirement was to

[19] *Proportional Grain Rates from Minnesota and Wisconsin to Eastern Destinations*, 68 I. C. C. 665 (1922); *Coal from the Southwest to Omaha, Nebraska, and Related Points*, 73 I. C. C. 536 (1922); *U. S. v. Chicago, Milwaukee, St. Paul & Pacific R. R. Co.*, 294 U. S. 499 (1935).

[20] See p. 109, *infra*.

encourage the formation of motor freight associations to act as tariff publishing agents of the motor carriers, although many carriers filed individual tariffs with the Commission. The motor freight associations also serve as rate-making agencies for the member carriers and their effect is to introduce some degree of uniformity in rate-making in the areas which they cover.

The motor carriers maintain freight classifications similar, in many respects, to those maintained by railroads. The most widely used classification is the National Motor Freight Classification. Others are the Official Motor Classification, and the Coordinated Motor Classification, both used throughout New England. There are also many motor carriers which adhere to the Consolidated Freight Classification—the railroad classification. The National Motor Freight Classification is substantially the same as the railroad classifications. The Official and the Coordinated motor classifications were constructed independently of the rail classifications, and an attempt was made in their construction to make cost-of-service factors, particularly weight density, the controlling influence in determining the ratings. The Interstate Commerce Commission, in commenting on the differences between the two New England classifications and the National Motor Freight Classification which is based on the rail classifications said: "From the standpoint of abstract reason, there can be little doubt that the theory followed in the construction of the New England classifications and rates is the sounder of the two."[21] The Commission considered the plan somewhat impracticable, however, as long as railroad classifications were constructed on a different basis. "It is evident that if the railroads are permitted to meet competitively the rates of the motor carriers where the latter have the advantage in costs of service, and at the same time the motor carriers refrain from meeting the rail rates where the railroads have the cost advantage, the net results will be a disadvantage to the motor carriers."[22]

Motor freight rates, like the classifications, are frequently based on the corresponding rail rates. In view of the competition between railroads and motor carriers this is not surprising, but the soundness of the practice is open to question if the rates of the various transportation agencies are to reflect the "inherent advantages" of each.

Motor carriers quote commodity rates as well as class rates, and maintain truck-load, less-than-truck-load, and some "any-quantity" rates.

Motor-carrier rates have some characteristics which have not been found in railroad rates. In some instances motor carriers maintain rules which permit rates to be constructed on a space basis instead of on a weight basis. In Central territory a "light and bulky rule" was maintained which provided that on shipments of articles rated first-class or lower, and weighing less than 12 pounds per cubic foot, the charges should be based on a weight of 12 pounds per cubic foot.[23] A rule of this sort has the same effect as a "weight or space" basis of computing charges commonly used by ocean carriers.

Another feature of motor-carrier rates is the maintenance of graded quantity rates or volume rates, i. e., rates which are lower in cents per hundred pounds for large than for small shipments. Volume rates are not to be confused with truckload rates. Truckload minimum weights have some relation to the capacity of a truck, but volume minima do not. Volume rates vary with the size of the shipment irrespective of the quantity that may be necessary to constitute a truckload. In *Rates between Arizona, California, New Mexico, and Texas*,[24] motor-vehicle class rates were authorized which were on three levels. The highest level applied on shipments weighing less than 5,000 pounds. On shipments weighing 5,000 to 10,000 pounds the rates were 10 cents lower, and on shipments weighing 10,000 pounds or more the rates were 20 cents lower than on shipments weighing less than 5,000. In *Central Territory Motor Carrier Rates*,[25] the Commission approved a basis of rates which provided that on articles rated first class the first-class rate applied only if the shipment weighed less than 5,000 pounds. Shipments of the same articles weighing 5,000, 10,000, and 16,000 pounds were charged 95, 90, and 85 percent, respectively, of the first-class rates, subject to certain exceptions. The term "weight break-downs" is commonly used to denote the system of grading rates according to the size of the shipment.

Volume rates of motor carriers have enabled them to compete for carload traffic of the railroads. The railroads, on the other hand, have found it advisable to copy the system of graded volume rates in order to compete with the motor carriers for shipments which are less than carloads but which are larger than the typical less-than-carload shipment.[26]

Little information is available concerning the charges of contract carriers by motor vehicle. Under the Motor Carrier Act, as amended in 1940, contract carriers are required to file with the Commission schedules of minimum charges. Actual rates charged may exceed these minima. The fact that common carriers complain of competition from contract carriers and have sought leg-

[21] *New England Motor Carrier Rates*, 8 M. C. C. 287, 321 (1938).
[22] *Ibid.*, p. 322.

[23] *Dishes or Ice Cream Cones Classification Rating*, 12 M. C. C. 55 (1939).
[24] 3 M. C. C. 505 (1937).
[25] 21 M. C. C. 473 (1940).
[26] See p. 107, *infra*.

islation to restrict their operations and control their rates indicates that in many cases contract-carrier rates are lower than those maintained by common carriers. This is in conformity with the lower cost of contract-carrier service which, in turn, grows out of the difference in the service provided. It is to be expected that contract-carrier charges would conform closely to the costs of providing the service in question, since their charges are largely a matter of bargain between the carrier and its patrons, and since contract-carrier service is often an alternative to private transportation by the large industries. Substantial differences between contract-carrier charges and common-carrier rates are likely to appear when the common-carrier rates are related to rail rates rather than to cost of service. Common carriers often seek to force contract carriers to charge common-carrier rates, and this has been required by State authorities in some instances.

Prior to 1935 motor-carrier rates were not regulated by the Federal Government although many States exercised some degree of control over intrastate rates of motor carriers. The Motor Carrier Act of 1935 gave the Interstate Commerce Commission power to regulate rates of motor carriers. For common carriers the Commission may prescribe "the lawful" rate, or maximum and minimum, or maximum or minimum rates. Only minimum rates may be prescribed for contract carriers. Rarely have there been complaints that rates of common carriers by motor vehicle are excessive. Among the few examples are *Linoleum, etc.-Salem, N. J.-Baltimore, Md.*,[27] and *Southwestern Class and Commodity Rates*.[28] Thus the Commission has had little occasion to exercise its power to prescribe maximum reasonable rates for motor carriers.

Of much more importance, in practice, is the Commission's power to prescribe minimum rates. Most of the motor-carrier rate cases which come before the Commission raise the question of whether existing or proposed rates are too low. When reductions are proposed by motor carriers objection usually appears from competing motor carriers or from railroads. The exercise of the Commission's power over minimum rates of motor carriers is discussed below.[29]

Rates of Water Carriers

Inland Waterways

Generalization concerning rates for transportation on inland waterways is difficult because of wide variations in costs of operation and in rates. These variations are due to differences in the nature of the waterways, channel depths, types of craft used on the waterways, and differences in the commodities transported and the length of hauls.

Transportation on the waterways is performed by three classes of carriers—common carriers, contract carriers, and private or industrial carriers. The first two are carriers for hire; the third represents individualized transportation performed largely by industrial concerns. This classification of carriers is overlapped to some extent by the fact that some common carriers have also performed a contract-carrier service, and that industrial carriers sometimes transport for hire. A rough estimate made by the War Department of the proportion of the total tonnage on inland waterways carried by each type of carrier is as follows: Common carriers, 5 percent; contract carriers, 15 percent; private carriers, 80 percent.

Common-carrier rates.—Common-carrier service is naturally more expensive than contract-carrier service since it involves transportation over regular routes, usually on schedule, and the handling of miscellaneous shipments, frequently in small lots. For these reasons common-carrier rates are higher than contract-carrier charges. The common-carrier rates, furthermore, are commonly related directly to the rail rates by fixed differentials.

Prior to the enactment of the Transportation Act of 1940 the port-to-port rates of common carriers on inland waterways were not subject to regulation and the water carriers were free to determine their own charges. These rates, however, have generally been fixed at differentials under the all-rail rates between the same points, although the differentials are not uniform. On the Mississippi and Ohio rivers the port-to-port rates of the common-carrier barge lines have generally been 80 percent of the all-rail rates. Joint rail-and-barge rates on the Mississippi River system have been established in recent years, largely under the stimulus provided by the Denison Act of 1928 which practically forced the railroads to establish joint rates with the barge lines.[30] These joint rail-barge rates have also been based on the 20 percent differential under the all-rail rates. The soundness of this differential has been questioned, and it seems to have been based on tradition, rather than on careful analysis.[31] The whole question of the relationship between all-rail and barge-rail or rail-barge rates is pending before the Interstate Commerce Commission.[32] The 20-percent differentials are not rigidly ob-

[27] 11 M. C. C. 514, 516 (1938).

[28] 8 M. C. C. 539, 542 (1938).

[29] See pp. 110–114, *infra*.

[30] See *Through Routes and Joint Rates between Inland Waterways Carp. and Other Common Carriers*, 153 I. C. C. 129 (1929); *Through Routes and Joint Rates between Ohio and Mississippi Transit Co. and Other Common Carriers*, 156 I. C. C. 724 (1929); *Application of American Barge Line Co.*, 182 I. C. C. 521 (1932); *Application of Mississippi Valley Barge Line Co.*, 167 I. C. C. 41 (1930).

[31] See Concurring Opinion of Commissioner Woodlock in *Through Routes and Joint Rates Between Inland Waterways Corp. and Other Common Carriers*, 153 I. C. C. 129, 138 (1929).

[32] *Rail and Barge Joint Rates* (Docket 26, 712).

served. On both port-to-port traffic and on joint rail-and-barge traffic the railroad freight classifications or slight modifications thereof, are generally observed.

In addition to the joint rail-barge rates the barge lines sometimes maintain joint rates with motor carriers. There are also joint rail-barge-ocean rates maintained from some points in the Mississippi Valley to the Pacific Coast, via New Orleans. These rates are differentially lower than the corresponding rail-ocean rates between the same points via New Orleans, and the rail-ocean rates, in turn, are lower than the all-rail rates between the same points.

Contract-carrier rates.—The charges of contract carriers on the inland waterways, unlike those of common carriers, are not made with reference to rail rates. They reflect very closely the costs of transportation and vary according to the nature of the service performed. A study of typical contract-carrier charges for the transportation of the principal commodities which are moved by contract carriers on inland waterways has been made by the War Department. Charges for contract-carrier service commonly vary with the size of the shipment and are often based on minimum quantities of not less than 300 tons or 500 tons. The charges made by contract carriers tend to be less per ton-mile for longer hauls. Charges for transporting coal on the various streams in the Mississippi River system were found to average 4.3 mills per ton-mile for hauls of less than 100 miles, but the average for all distances is only 2.3 mills.[33] For petroleum and its products average revenue for all hauls on the Mississippi River system is 2.85 mills per ton-mile;[34] for steel moving from 600 to 1,800 miles the charges average 3.2 mills per ton-mile.[35] On grain the rates for contract carriage on 9-foot waterways average only 2.1 mills per ton-mile.[36] Transportation charges of contract carriers are lower on the Mississippi River system than on the Coastal rivers. On the Pacific Coast rivers the charges are higher than elsewhere in the United States. In some cases these charges are higher than rail rates for similar distances, particularly where there is no rail service available. On bulk commodities the average level of contract-carrier charges varies on the Pacific Coast rivers from 3.4 cents per ton-mile at 20 miles to 7.8 mills at 190 miles. River hauls on the Pacific Coast streams are comparatively short.

Private carrier costs.—As has been pointed out, a large part of the traffic moved on inland waterways is carried by private or industrial carriers. No rates are involved, but since shippers have the alternative of employing contract carriers or performing their own transportation, contract carrier charges cannot exceed the cost of private carriage if the business is to thrive. In some cases, however, private transportation is performed by industries at a cost which is above the charges exacted by contract carriers. The War Department has made a study of the costs of private transportation on the inland waterways. Coal is carried on the Mississippi River system at costs ranging from 2 mills to 4.2 mills per ton-mile, and petroleum at costs ranging from 2 to 6 mills per ton-mile.[37]

The figures compiled by the War Department show that both contract-carrier rates and private-carrier costs of transportation are very low on most of the inland waterways of the United States. In making comparisons, however, allowance must be made for the fact that in many cases distances by water are greater than rail distances between the same points. Moreover, part of the costs of providing inland water transportation are borne by the general public through taxation. The real cost of inland waterway transportation cannot be determined without an inclusion of the costs which are defrayed by the taxpayer.

Rate regulation.—In the past there has been no regulation of the port-to-port rates of water carriers on inland waterways. The Transportation Act of 1940, however, gives the Interstate Commerce Commission jurisdiction over these rates. This power extends to the prescription of maximum and minimum rates for common carriers and minimum rates for such contract carriers as are not exempt from the Act. The Commission, however, has had jurisdiction over joint rail-and-water rates since its creation in 1887. Until the enactment of the Transportation Act of 1940 the Commission's power over these rates only extended to the prescription of maximum reasonable rates.

In general it may be said that there has been little need for prescribing maximum rates for water carriers operating upon the inland waterways. Common-carrier rates have been kept down by the necessity of maintaining rates differentially lower than the rail rates in order to attract traffic to the water lines. The fact that the railroads have frequently reduced their rail rates where they come into competition with water carriers has often made a low rate "ceiling" which limited the charges that could be made by the water carriers. Contract-carrier service has been a highly competitive business, and charges made by these carriers, furthermore, have been held down by the freedom of the individual to transport his own commodities upon the waterways as a private carrier.

Whether there is need for empowering regulatory bodies to prescribe the minimum rates for inland water

[33] See part II, section IV, of this report.
[34] *Ibid.*
[35] *Ibid.*

carriers has been a debatable question. For a long time Congress proceeded on the assumption that this power was not necessary. The Interstate Commerce Commission, accordingly, was not given the power to prescribe minimum rates on joint rail-water hauls until 1940. Since port-to-port rates of inland water carriers were unregulated there were, of course, no limitations on rate reductions. Only when water carriers were controlled by railroads did the Interstate Commerce Commission have power to control the minimum rates of the water lines, and this power did not exist until 1920.

Spokesmen for water transportation contend that competition between inland water carriers has never been of the "ruinous" type. It is claimed that since the costs of inland water carriers are largely direct costs, which vary with the amount of traffic handled, there is little incentive to charge less-than-cost rates in order to obtain traffic,[38] nor is there any possibility of profitably doing so because of the absence of any noncompetitive traffic which can be made to bear high rates.

On the Great Lakes

On the Great Lakes enormous quantities of iron ore, stone, coal, and grain are transported in huge cargo vessels constructed especially for carrying bulk commodities. These commodities are transported almost exclusively by industrial and contract carriers. Prior to the enactment of the Transportation Act of 1940 the charges of contract carriers on the Lakes were not subject to regulation. The rates of contract carriers for transporting grain have tended to fluctuate continually, but the rates on ore and coal have been more stable. Grain is transported at charges varying from 0.7 mill per ton-mile to 1 mill.[39] Iron-ore charges yield about 0.8 mill per ton-mile, and coal 0.5 mill.[40] These rates are so low that the railroads do not compete for the traffic.

There is some transportation of general cargoes on the lakes by common carriers. The port-to-port rates of these carriers have been subject to regulation by the Maritime Commission, but the Transportation Act of 1940 transfers control to the Interstate Commerce Commission. Joint lake-rail rates, however, have long been under the control of the Interstate Commerce Commission. The lake-rail routes from points in the East to points in the West are competitive with all-rail routes. Joint lake-rail class rates on this traffic were prescribed by the Interstate Commerce Commission in *Lake and Rail Class and Commodity Rates*.[41] The lake-rail rates from eastern points to points in western trunk-line territory were made differentials under the all-rail rates. The differentials are the greatest at points between which the lake-rail routes are fairly direct and are less at points between which the lake-rail routes are somewhat circuitous. Differentials were prescribed on first-class traffic. The maintenance of the usual percentage relationships between classes gives lower differentials on the lower-rated articles. Some commodity rates are also fixed at differentials under the all-rail rates.

The differentials prescribed by the Commission do not seem to have been based on cost analyses. Interested shippers are inclined to believe that the differentials are not as great as they should be. The contention is that the greater economy of water transportation justifies lower lake-rail rates than are permitted by the existing differentials.

Coastwise and Intercoastal

Coastwise and intercoastal traffic is carried by common, contract, and private carriers. The tanker traffic is almost entirely private transportation.[42] Contract carriage is important in the transportation of such commodities as coal, sulfur, phosphate rock, sand and gravel, and lumber.[43] Common carriage, however, is more important than contract and private carriage in the intercoastal and coastwise trades, if the tanker service is excluded.[44]

Intercoastal rates.—The rates of common carriers by water operating between the Atlantic and Pacific coasts are port-to-port rates. Although most of the tonnage originates at, or is destined to, interior points and so necessitates a rail or truck haul, the intercoastal carriers in this trade do not make joint through rates with either railroads or motor trucks. Some of the carriers in the Gulf-Intercoastal trade, however, maintain joint rates with rail and barge lines to and from points in the Middle West via the Gulf ports.

On traffic between the Atlantic and Pacific ports the rates are blanketed, i. e., they are the same between any of the Atlantic and any of the Pacific ports. The Gulf-Intercoastal rates are also generally blanketed at Pacific Coast ports north of Los Angeles to and including Puget Sound ports.[45] The blanketing of rates, however, is modified in the Atlantic-Pacific trade by the maintenance of a so-called "port equalization rule." This rule authorizes certain deductions in rates on traffic moving through the ports of New York and Philadelphia and offsets the "port differentials" maintained by the railroads. This equalizes the combination of rail and

[38] *Ibid.*
[39] *Ibid.*
[40] *Ibid.*
[41] 205 I. C. C. 191 (1935); 214 I. C. C. 93 (1936).

[42] United States Maritime Commission, *Economic Survey of Coastwise and Intercoastal Shipping* (1939), p. 11.
[43] *Ibid.*, p. 11.
[44] *Ibid.*
[45] *Ibid.*, p. 18.

water rates through the ports of Baltimore, Philadelphia, and New York.[46]

In the Atlantic-Pacific trade the carriers are divided into A and B lines. At times there also have been C lines. Because of their less frequent sailings the B lines charge rates on some traffic which are differentially lower than those charged by the A lines. In the Gulf-Intercoastal trade, however, uniform rates are maintained by all the lines.

Due to railroad competition intercoastal lines maintain both carload and less-than-carload rates similar to the practice prevailing on the railroads. Mixed-carload rules exist also, as on the railroads, to enable mixed shipments to move at carload rates.

The competition between the intercoastal lines and the transcontinental railroads has at times been intense. Prior to the amendments to the long-and-short-haul clause in 1910 which made the clause effective, the transcontinental railroads commonly charged lower rates to and from Pacific Coast ports than applied to and from intermediate points in "intermountain territory." This was done in order to meet the competition of the water lines. By a series of decisions between 1911 and 1918 the Interstate Commerce Commission brought intercoastal rates into conformity with the long-and-short-haul clause.[47] Since then the Commission has refused to modify its position with respect to these rates.[48] On a limited number of commodities, however, the Commission has granted the railroads fourth-section relief.[49] Forcing the railroads to comply with the long-and-short-haul clause on transcontinental traffic gave them the alternatives of raising the rates at the Pacific Coast points, of lowering the rates at intermediate points, or of effecting some compromise between the first two choices. Generally speaking, the railroads raised the rates to the Pacific Coast. This had the effect of diverting traffic to the water lines and increasing the importance of intercoastal shipping.

Coastwise rates.—Port-to-port rates in the coastwise service have naturally been lower than rail rates. In order to offset the disadvantages of shipping by water, the water lines maintain rates differentially lower than the rail rates. The granting of fourth-section relief to railroads to enable them to meet the competition of coastwise vessels at the ports has narrowed the spread between the rail and the water rates and has made a difficult situation for the water lines.[50] Many joint rail and ocean rates are maintained by coastwise lines and connecting railroads.

Regulation of coastwise and intercoastal rates.—From 1887 to the present time joint rail and water rates maintained in connection with the coastwise and intercoastal water carriers have been subject to the jurisdiction of the Interstate Commerce Commission. After the enactment of the Panama Canal Act in 1912 the Commission had jurisdiction over the port-to-port rates of water carriers that were owned or controlled by competing railroads.

By the Shipping Act of 1916 the port-to-port rates of coastwise and intercoastal water carriers not already subject to the jurisdiction of the Interstate Commerce Commission were subjected to control by the United States Shipping Board. This control, however, was weak. Common carriers were required to file maximum rates, but these were often much higher than the rates actually charged. Regulation was strengthened, so far as the intercoastal carriers were concerned, by the Intercoastal Shipping Act of 1933. This act applied both to common and contract carriers in the intercoastal service and required publication of actual rates and strict adherence thereto. Amendments to the Intercoastal Shipping Act in 1938 further strengthened the authority of the United States Maritime Commission (successor to the United States Shipping Board Bureau of the Department of Commerce, which had succeeded the United States Shipping Board) and extended its provisions to common carriers in the coastwise service but not to contract carriers. The Transportation Act of 1940 gave the Interstate Commerce Commission the jurisdiction over coastwise and intercoastal carriers formerly possessed by the Maritime Commission. It extended control over contract carriers in the coastwise service, but numerous exemptions provided in the act have the effect of excluding many contract carriers from the Commission's authority.

The essentially competitive nature of water-carrier services explains both the slowness with which coastwise and intercoastal carriers came to be subjected to effective regulation and the incompleteness and weakness of such

[46] *Intercoastal Rate Structure*, 2 U. S. M. C. 285, 281 (1940).

[47] *Railroad Commission of Nevada* v. *Southern Pacific Co.*, 21 I. C. C. 329 (1911); *City of Spokane et al.* v. *Northern Pacific Ry. Co. et al.* 21 I. C. C. 400 (1911); *Commodity Rates to Pacific Coast Terminals and Intermediate Points*, 32 I. C. C. 611 (1915); 34 I. C. C. 13 (1915); *In the Matter of Reopening Fourth Section Applications*, 40 I. C. C. 35 (1916); *Transcontinental Rates*, 46 I. C. C. 236 (1917); *Transcontinental Commodity Rates*, 48 I. C. C. 79 (1918).

[48] *Transcontinental Cases of 1922*, 74 I. C. C. 48; *Commodity Rates to Pacific Coast Terminals*, 107 I. C. C. 421 (1926).

[49] See *Transcontinental Cases of 1922*, 74 I. C. C. 48, 60–62, 83–89, 63 & 90; *Sugar Cases of 1933*, 195 I. C. C. 127 (1933); *Sugar from California to Chicago*, 211 I. C. C. 239 (1935); *Soya Bean Meal to Pacific Coast Ports*, 225 I. C. C. 51 (1937).

[50] For examples of granting of fourth-section relief to railroads to meet the competition of coastwise shipping see *Citrus Fruit from Florida to North Atlantic Ports*, 211 I. C. C. 535 (1935), 218 I. C. C. 657 (1936), 226 I. C. C. 315 (1938); *Pacific Coast Fourth Section Applications*, 129 I. C. C. 3 (1927), 165 I. C. C. 373 (1930), 173 I. C. C. 577 (1931), 190 I. C. C. 273 (1932), 196 I. C. C. 296 (1933), 200 I. C. C. 259 (1934).

control as has existed until recently. Competing carriers have contended for coastwise and intercoastal traffic, and their rates have been held down also by the necessity of maintaining rates differentially lower than those maintained by railroads. Under these conditions few complaints arose of excessive rates.

Although the Government has not attempted until recently to control competition between water carriers in the coastwise and intercoastal services by means of the minimum-rate power, freely competitive conditions have not at all times prevailed. "Conference agreements" which were legalized by the Shipping Act of 1916, if approved by the Shipping Board, have resulted in some control over rates and services. The principal "conferences" operating in the intercoastal and coastwise services are the Intercoastal Steamship Freight Association, the Gulf-Intercoastal Conference, the Atlantic Coastwise Steamship Conference, the North Atlantic Gulf Steamship Association, the Puget Sound Carriers Conference, the Pacific Coastwise Conference, and the Pacific Lumber Carriers Association.[51] Conferences have had a difficult time, particularly in the intercoastal trade, in their efforts to control competition. The situation may be described as one of periods of rate stability obtained through the conferences, followed by periods of very severe rate wars.[52] The extreme severity of competition in the intercoastal trade, the inability of the conferences to control competition for more than short periods of time, and the deplorable financial condition of the water lines, were responsible for the strengthening of regulation by the Intercoastal Shipping Act of 1933, and the grant to the Maritime Commission of power over minimum rates in 1938. In 1934 the Federal Coordinator of Transportation was convinced that the demoralization of conditions in the coastwise and intercoastal shipping business was due to ruthless competition and that the appropriate regulatory authorities should have the power to prescribe the minimum rates of water carriers.[53]

Pipe-Line Rates

Pipe lines are important in the transportation of crude oil and refined petroleum products.[54] Rates for the transportation of crude oil by pipe line have generally been very low in comparison with corresponding rates of railroads. The Interstate Commerce Commission has recently pointed out that rates for the transportation of crude oil average about 35.72 percent of the corresponding rail rates.[55] The low level of pipe-line rates as compared with railroad rates explains why such a large proportion of the crude oil is transported by pipe lines.

Although the pipe-line rates are low, they have yielded the pipe-line companies very large profits, and a recent decision of the Interstate Commerce Commission found many pipe-line rates to be unreasonably high. The Commission held that 8 percent on their value should be considered a fair return for pipe lines. Fourteen pipe-line companies earned less than this return in 1935; 21 earned a return varying from 9.72 percent to 46.86 percent.

The fact that pipe lines have been considered as plant facilities of the large oil companies, and have in many cases been owned by the oil companies either directly or through subsidiaries, explains why the pipe-line rates have not been lower. The oil companies have found it to their advantage to maintain these rates at a higher level than strict cost-of-service considerations made necessary. Owners of pipe lines get their oil transported in effect at cost, but by charging others high rates place independent refiners at a disadvantage, it is alleged. This situation has been one which has aroused criticism and has, from time to time, led to a demand for legislation which would compel a divorcement of pipe lines from other branches of the oil industry.[56] Bills have frequently been introduced in Congress to this effect. Regardless of the merits of such a proposal, it is clear that as long as the large oil companies own or control pipe lines there may be a tendency for them to keep the rates high.

Railroads generally have not attempted to meet the rates of pipe lines on crude oil. In some instances, however, rail rates on crude oil seem to have been influenced by pipe-line rates.[57]

Pipe-line rates on gasoline are higher than the rates on crude oil, which, in 1932, averaged 0.72 mills per barrel-mile on 4.61 mills per ton-mile. In 1934, typical gasoline pipe-line rates from the midcontinent field yielded revenues of about 11.6 mills per ton-mile for an average haul of 566 miles. From Atlantic Coast ports to representative eastern points they yielded about 8.82 mills per ton-mile for an average haul of about 215

[51] U. S. Maritime Commission, *Economic Survey of Coastwise and Intercoastal Shipping* (1939), pp. 17–19.

[52] For a history of recent intercoastal conferences see *Rates of Nelson Steamship Co.*, 1 U. S. S. B. B. 326, 328–330 (1934); *Intercoastal Investigation, 1935*, 1 U. S. S. B. B. 400, 406–407 (1935).

[53] *Regulation of Transportation Agencies*, 73d Cong., 2d sess., S. Doc. No. 152 (1934), pp. 9–13.

[54] See pp. 456 ff., *supra*.

[55] *Reduced Pipe-Line Rates and Gathering Charges*, 243 I. C. C. 115, 124 (1940).

[56] See Interstate Commerce Commission, *Railroad Discrimination and Monopolies in Coal and Oil*, 59th Cong., 2d sess., H. Doc. No. 606 (1907); Federal Trade Commission, *Report on the Price of Gasoline in 1915* (1917), and *Petroleum Industry: Prices, Profits, and Competition*, 70th Cong., 1st sess., S. Doc. No. 61 (1928).

[57] *Gilliland Oil Co. v. Atchison, Topeka & Santa Fe Ry. Co. et al.*, 161 I. C. C. 87, 89 (1930).

miles.[58] In some instances gasoline pipe-line rates have been made approximately the same as the rail rates between the same points. In other instances gasoline rates by pipe line have been established at about half the corresponding rail rates. In 1940 a study of 81 representative gasoline rates showed the average pipe-line rates to be about 63 percent of the corresponding railroad rates.[59]

Pipe-line rates on gasoline have influenced railroad rates far more than have crude-oil rates of the pipe lines. In many cases the Interstate Commerce Commission has shown that rail rates on gasoline and other products of petroleum have been depressed by pipe-line competition.[60] Low rail rates on gasoline have sometimes been forced by low pipe-line rates on crude oil in order to enable refineries near the oil fields to compete with those nearer consuming markets.[61] In fact, the Commission's ideas as to what constituted maximum reasonable rates on petroleum products seem to have been affected by the realization that low rail rates were required if the railroads were to compete with pipe lines.[62]

Fourth-section relief has sometimes been granted to railroads to enable them to meet actual or potential pipe-line competition in the transportation of petroleum products.[63]

The Interstate Commerce Commission has had jurisdiction over pipe lines and their rates since 1906. The only case decided by the Commission which has involved the reasonableness of pipe-line rates is *Reduced Pipe-Line Rates and Gathering Charges*, decided December 23, 1940.[64]

Railway Express Rates

The express service provided by the railroads through the Railway Express Agency is especially devised for the transportation of valuable articles, small packages, and commodities requiring special care and expedited service. Express is usually transported in express cars on regular passenger trains.

The rate levels for express service reflect the higher costs of such a service and its value to the shipper. The Commission has had definite jurisdiction over express rates since 1906. The present express rate structure resulted from a comprehensive investigation of express rates by the Interstate Commerce Commission in 1912.[65] Modifications in the structure then established have been made from time to time.[66]

Articles handled by express are divided into three classes for which different rate levels are in effect. All commodities not specifically excepted are in first class. Second-class traffic consists mostly of foods and drinks. Second-class rates may not exceed 75 percent of the first-class rates. Printed matter of various kinds constitutes third-class traffic. Some commodities which require the speed of express service, principally perishable foods, move under special commodity rates.

For the purpose of making express rates the country is divided into blocks, each bounded by lines of longitude and latitude, all 63 miles long, but varying in width from 45 to 62 miles from the northernmost to the southernmost tier. Interblock first-class rates are constructed on a distance basis. Each block is divided into subblocks which are used for computing rates over short distances. Different levels of rates are provided for three geographic zones, corresponding substantially to the railroad freight classification territories.

Although the express agency furnishes a specialized service there is competition with the regular railroad freight service and with other transport agencies. Improved fast-freight service by the railroads encroaches upon the express traffic in perishable goods. Freight forwarders, in recent years, have taken some traffic which would otherwise move by express, and the Government's parcel-post system is competitive with express in the handling of small parcels. Motor carriers have also provided the express agency with competition. Some of the recent modifications in express rates have been designed to enable the express agency to meet competition more effectively.

Under contracts with the various railroads the express agency is prohibited from establishing any rates less than twice the prevailing first-class railroad rates between the same points without the consent of the railroad companies serving that territory, or unless so ordered by State or Federal authority.[67] The effect of this provision is to limit competition between the express service and railroad freight service and to confine the express business to the particular class of service which the ex-

[58] See part II, section V, of this report.

[59] *Ibid.*, p. 467.

[60] *Cook & Brown Lime Co. et al.* v. *Abilene & Southern Ry. Co.*, 222 I. C. C. 739, 740 (1937); *Refined Petroleum Products in the Southwest*, 203 I. C. C. 103 (1934).

[61] *Refined Petroleum Products in the Southwest*, 171 I. C. C. 381, 424 (1931).

[62] See statement of Commissioner Mahaffie in *Petroleum Products in the Southwest*, 174 I. C. C. 745, 755 (1931), and of Commissioner Porter in *Refined Petroleum Products in the Southwest*, 171 I. C. C. 381, 453 (1931).

[63] E. g., *Gasoline from Superior, Wis.*, 222 I. C. C. 487 (1937); *Petroleum and Petroleum Products*, 183 I. C. C. 24 (1932).

[64] 243 I. C. C. 115.

[65] *In Re Express Rates, Practices, Accounts, and Revenues*, 24 I. C. C. 380 (1912), 28 I. C. C. 131 (1913), 35 I. C. C. 3 (1915).

[66] See particularly *Express Rates, 1922*, 83 I. C. C. 606 (1923), 89 I. C. C. 297 (1924); *Express Rates, 1938–1939*, 231 I. C. C. 471 (1939).

[67] *R. W. Burch, Inc., et al.* v. *Railway Express Agency, Inc., et al.*, 190 I. C. C. 520, 530 (1932).

press companies have traditionally provided. There are some instances, however, where express commodity rates have been established as low, or even lower, than railroad rates.

Air Express Rates

Although the amount of freight or express carried by air lines is insignificant when compared to that carried by other transportation agencies, air traffic is growing rapidly. At the present time air express in the United States is practically all handled through the Railway Express Agency, which has contracts with the principal air lines.

There is no classification applicable to air express. All articles are carried at the same rate except that newspapers, when shipped in quantities of 25 pounds or more, are charged 60 percent of the regular rates, and racing forms also receive special rates.

Air express rates are constructed on a distance basis. There is a base rate of 4 cents per pound for the first 149 miles and 4 cents a pound for each additional hundred miles or fraction thereof. A system of arbitraries, however, is provided for short hauls and for small packages, which increases the charges for such traffic. Light and bulky articles are charged on a space basis; i. e., 400 cubic inches constitutes a pound.

The contract between the Railway Express Agency and the air lines provides that air express rates may not be reduced without the consent of the agency to a level which is less than twice the existing first-class rail express rate. The lawfulness of this arrangement and its effect are under investigation by the Civil Aeronautics Board.

Under the Civil Aeronautics Act of 1938 air carriers were required to publish tariffs showing their rates and fares and to file them with the Civil Aeronautics Authority. Rates and fares must be just and reasonable, and there are provisions in the law against unjust discrimination and undue preference and prejudice comparable to the provisions in the Interstate Commerce Act relating to rail and motor-carrier rates. The Civil Aeronautics Board, which has succeeded the Civil Aeronautics Authority, has the power to prescribe both maximum and minimum reasonable rates for air carriers. These powers, however, have never been exercised. In its Annual Report for 1940 the Civil Aeronautics Authority pointed out that certain inconsistencies and inequalities in fares and rates which had been disclosed as a result of studies made by its staff were being adjusted informally with the carriers.[68]

[68] Second Annual Report of the Civil Aeronautics Authority (1940), p. 8.

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Freight-Forwarder Rates

Although freight forwarders are not of recent origin they have assumed increasing importance in recent years. In 1936 the three largest forwarders had gross revenues of about $102,000,000, equal to about 45 percent of the total revenue received by the railroads in that year from less-than-carload shipments.[69]

Freight forwarders charge shippers rates which are generally less, although sometimes equal to, the railroad less-than-carload rates. These shipments are combined into carload or truckload lots. When these shipments move for themselves by rail the forwarders pay the regular carload rates, retaining the difference between the rate charged the shipper and the rate paid to the railroad.

The three large forwarders now publish their rates. Formerly they often made special rates to large shippers, or made concessions from their regular charges. In the Freight Forwarding Investigation the Commission said: "It appears that such rates are now generally adhered to," [70] but since the forwarders are not regulated and required by law to observe their published tariffs, it is by no means certain that their tariffs are always strictly observed.[71]

Rates charged by forwarders are only slightly lower than rail l. c. l. rates.[72] The Interstate Commerce Commission has pointed out that forwarder rates from St. Louis to certain points in Texas were 3 cents per hundred pounds lower than the railroad l. c. l. rates on first-class traffic, 2 cents lower on second class, and about 1 cent lower on third class.[73] Commissioner Eastman was inclined to believe that the savings to shippers represented by the differences in the forwarder rates and the rail l. c. l. rates were generally greater than the above figures would indicate.[74] There are some instances, however, in which the forwarders charge rates which are the same as the rail l. c. l. rates, relying on the superior service which they provide to obtain the traffic.

As noted above freight forwarder rates are not regulated. The Interstate Commerce Commission has no jurisdiction over them. Bills to regulate forwarders have been introduced into Congress in recent years and have been considered by the appropriate committees. No legislation covering freight-forwarder operations has been enacted by Congress up to the present time.

[69] *Freight Forwarding Investigation*, 229 I. C. C. 201, 203 (1938).

[70] 229 I. C. C. 201, 211.

[71] See testimony of Mr. Hastings, vice president in charge of traffic, Santa Fe Ry., in *Less-than-Carload Freight Traffic and Freight Forwarder Carload Traffic*, Hearings before a subcommittee of the Committee on Interstate Commerce, U. S. Senate, 76th Cong., 3d sess., on S. Res. 146, p. 211 (June 5 to 24, 1940).

[72] 229 I. C. C. 201, 211.

[73] *Ibid.*

[74] *Ibid.*, pp. 310 311.

CURRENT PROBLEMS IN RATE MAKING AND REGULATION WITH EMPHASIS ON PUBLIC POLICY

The Fair-Return-on-Fair-Value Doctrine

In the days when the chief objective of regulation was to restrain the railroad monopoly, or seeming monopoly, the courts developed the fair-return-on-fair-value standard as a limitation on the power of commissions and legislative bodies to reduce rates. The rule was first stated in the famous *Smyth* v. *Ames* decision of the Supreme Court of the United States in 1898.[75] Since the courts, in later cases, defined "fair return" as a return which would attract capital to the industry, it became clear that a return which met the judicial test was, from an economic point of view, an adequate return. Thus the *Smyth* v. *Ames* rule, which was originally the criterion for avoiding confiscatory rates, became the standard for setting the rate level. Above this level rates did not need to rise, since such a return was ample to attract capital; below it they could not go without judicial veto of the Commission's action. The Transportation Act of 1920 added section 15a to the Interstate Commerce Act in which the Interstate Commerce Commission was directed in prescribing rates, to "initiate, modify, establish, or adjust such rates so that carriers as a whole (or as a whole in each of such rate groups or territories, as the Commission may from time to time designate) will, under honest, efficient, and economical management and reasonable expenditures for maintenance of way, structures, and equipment, earn an aggregate annual net railway operating income equal, as nearly as may be, to a fair return upon the aggregate value of the railway property of such carriers held for and used in the service of transportation." Thus, the *Smyth* v. *Ames* rule of the courts was adopted by the legislative branch of the government as a standard for prescribing the level of railroad rates, with the important difference that Congress set up this standard for the railroads "as a whole" or "as a whole in * * * rate groups," whereas the courts had applied it to individual carriers.

In conformity with the mandate of the Act, the Interstate Commerce Commission in *Increased Rates, 1920*, proceeded to increase railroad rates which had been intentionally held down by the Government during the wartime period of Federal operation of railroads. In subsequent rate-level cases the needs of the railroads were a major consideration, although the Commission did not succeed in prescribing a level of rates which would yield the desired return to the carriers.

In 1933 the rule of rate making provided by section 15a was rewritten. The new rule provided that "In the exercise of its power to prescribe just and reasonable rates the Commission shall give due consideration, among other factors, to the effect of rates on the movement of traffic; to the need, in the public interest, of adequate and efficient railway transportation service at the lowest cost consistent with the furnishing of such service; and to the need of revenues sufficient to enable the carriers, under honest, economical, and efficient management, to provide such service."

Several points regarding the changes in the language of section 15a should be emphasized. First, it will be noted that the definite standard of fair return on fair value gives way to a more indefinite standard, viz, the need of revenues sufficient to enable the carriers to provide adequate and efficient railway transportation service. Furthermore, under the original section 15a, revenue need of the carriers was the only standard prescribed by this section of the Act, whereas the revised section 15a makes revenue need only one of three factors to be considered in fixing rates. A third point is that the "effect of rates on the movement of traffic" is specifically mentioned as a factor to be considered by the Commission.

These changes in section 15a reflect certain difficulties that were encountered in the rate-level cases which came up for consideration before 1933. Aside from the difficulties growing out of the indefiniteness of the "fair value" concept as interpreted by the courts, there were two main difficulties with the old section 15a. One difficulty was that section 15a gave rise to the belief that railroad earnings could be stabilized, regardless of the ups and downs of general business activity. The Commission occasionally pointed out the fallacy in such a belief. Thus, in *Reduced Rates, 1922*, the Commission said: "Section 15a, reasonably construed, contemplates the determination of a return which the carriers collectively or in rate groups may attain over a period of time under rates adjusted from time to time with that object in view. The phrase 'from time to time' does not mean that we should adjust rates to meet business fluctuations."[76] In fact, the reductions in rates required in that proceeding were made at a time when the railroads were not making the "fair return" contemplated by the Act. Professor I. L. Sharfman has also emphasized the falsity of the belief that railroad earnings can be stabilized, regardless of business conditions:

> In an economic system in which progressive change in existing arrangements and the chaotic succession of cyclical fluctua-

[75] 169 U. S. 466.

[76] 68 I. C. C. 676, 680.

tions create a large measure of instability, instability must, for the most part, be the lot of the railroads also. The hope that rate regulation will at all times afford earnings adequate but not excessive—that a formula involving property value and a rate of return thereon will mark out for the railroads a calm course through troubled economic waters—is obviously an illusory one; and any attempt to maintain a steady flow of railroad income by adjusting rates inversely to the volume of traffic is not only bound to prove impracticable but is clearly unwarranted in its presumption that the philosophy of regulation bestows upon the carriers so preferred a status in the ranks of industry. The railroads, as an integral part of the economic system, must inevitably share the common fate; and this circumstance precludes sole regard for the maintenance of earnings through rate adjustments.[77]

The second difficulty with the fair-return-on-fair-value rule was that under the conditions which prevailed after 1920 it was virtually impossible to maintain rates at a level which would yield the desired revenues. For this situation there were two main reasons.

The first was the decline in business activity and traffic, particularly after 1929. The second reason for the failure to maintain railroad earnings was the inability of the remaining traffic to stand rates sufficiently high to earn the fair return contemplated by the Act. The inability of traffic to stand high rates was largely the result of the development of motor transport and to a lesser extent the increasing importance of pipe lines and of water transportation. Decentralization and relocation of industries, a smaller export business, and the decline in coal traffic resulting from increased efficiency in the utilization of coal and from increasing use of substitute fuels were also contributing factors. The inapplicability of the fair-return-on-fair-value standard under the conditions existing during the 1930's at that time was recognized by railroad management. In the rate-level cases of the depression period the carriers were not seeking rates which would yield a fair return on fair value; they were seeking rates that would enable them to pay fixed interest charges or to make such improvements in inadequate earnings as might be possible.

Experience with the fair-return-on-fair-value rule indicates that it is impractical of strict application under the conditions that have arisen in recent years. Modification of the rule of rate making in 1933 was a partial recognition of this fact. A technological revolution in the transport industry has occurred. The railroad industry has not yet adjusted itself to these changes. Although there is reason to believe that the railroads will continue to occupy an important, if not the most important, place in the transportation system, there is no denying that a large amount of capital invested in railroad facilities has been rendered functionally obsolete or obsolescent. In the absence of an unprecedented increase in the volume of traffic, much of the investment which will continue in use will be unable to earn the return which was expected when that investment was made.

The only way that a rate level could be maintained that would enable the railroads, under the conditions existing in the 30's, to earn a fair return upon the "value" of their properties would be through the suppression of the newer forms of transportation or by arbitrarily increasing the rates of all agencies of transport. Even if this policy were pursued it is by no means sure that the traffic would stand the rates which seemed necessary to give the desired income to the railroads. In any event such a policy would deprive the public of the benefits of technological improvements in transportation.

Dependence of the railroads on the fair-return-on-fair-value rule, or any similar rule of rate making, under recent conditions has three undesirable consequences: First, it raises false hopes on the part of the investors and owners; second, it results in the tendency to place unjustly upon regulatory bodies the responsibility for deficiencies in railroad income; third, it may lead management to become insensitive to changed conditions which the industry should seek to meet.

Although reliance on the fair-return-on-fair-value rule may be undesirable, it must be remembered that under existing interpretation of the Constitution, the fair-value doctrine will remain in the background as a protection of the individual carrier against confiscatory rates. A more realistic approach to rate problems than that implied in the old section 15a is not prevented, however.

Rate Regulation and Managerial Discretion

The impossibility of maintaining a rate level during the 20's and 30's which would yield the carriers a fair return on their fair value resulted from the inability of traffic to stand high rates. The real question in many of the rate-level cases was whether needed increases in revenues could be obtained from increases in rates. The carriers took the position that the Commission should not substitute its judgment for that of the carriers as to the revenue results of proposed changes in rates. The Commission never accepted the railroad position on this matter.[78] It is significant that Congress, in 1933, revised section 15a and specifically directed the Commission to take into consideration, in rate proceedings, "the effect of rates on the movement of traffic." The railroads, however, have objected to this change in section 15a, and the Committee of Six, composed of three railroad

[77] Sharfman, I. L., *The Interstate Commerce Commission*, pt. III, B. p. 295.

[78] See *Fifteen Per Cent Case, 1931*. 178 I. C. C. 539 (1931).

executives and three representatives of railroad labor, which made recommendations to the President in 1938 concerning the transportation situation, recommended the elimination of this provision from section 15a.[79] The removal of the disputed provision from section 15a, however, would not necessarily bring the results desired by the carriers because even before this provision was put into the act in 1933, the Commission considered it necessary and proper to take into consideration the effect of rates on the movement of traffic and on revenues.[80] This question also came up in passenger-fare cases during the depression period.[81]

Without attempting to discuss the merits of the Commission's action in particular cases we may make some generalizations concerning the matter of principle involved. As long as section 15a is in the Act and the Commission is charged with some responsibility for maintaining a level of rates that is adequate for the railroads, the Commission cannot ignore the revenue effects of proposed increases or reductions in rates. In the second place, it will probably be agreed that railroad managers should be in a much better position than a regulatory body to judge of the probable results of rate changes; therefore, great weight should be attached to the judgment of management on these questions. But if the carriers expect great weight to be given to their conclusions, certain things are necessary. The rates proposed by the carriers should be proposed in good faith; the rate changes should be well considered; and the conclusions of the carriers concerning their effects should be plausible. Professor Sharfman stated with regard to this problem "that section 15a should ever have been so simply construed by the carriers as to be deemed to require rate advances whenever such a return was not enjoyed—that the railroads should have sought higher rates when their earnings would probably not benefit therefrom—may seem incredible; but the Commission had ample occasion, notably in the 1931 proceeding, to emphasize the depressing effect of high charges upon the flow of traffic and to point out that requests for rate advances are sometimes deficient in good judgment, if not in good faith."[82] The Commission is not anxious to interfere with the managerial judgment of the carriers. If rate changes proposed by the carriers are well considered and reasonably supported, occasions for a clash between managerial judgment and Commission judgment over the probable effect of rate changes should not be numerous.

Readjustments in Railroad Rates

Under this heading mention will be made of recent changes in the railroad rate structure representing adjustments to new competitive and commercial situations. In connection with each of these changes the attitude of the Commission will be indicated insofar as the Commission has had occasion to consider the lawfulness of the rates.

Weakening of the value-of-service principle.—It was pointed out earlier that a long-established characteristic of railroad rates has been the practice of charging high rates on such traffic as could stand high charges. This practice had the approval of the Interstate Commerce Commission from its beginning.[83] Although value considerations have never been controlling, as a study of the Interstate Commerce Commission's decisions will reveal, it seems that the railroads not only have been permitted to adjust rates on particular commodities in accordance with their value but they may be compelled to do so.[84] This is a natural result of the process of determining the reasonableness of rates by comparing rates in question with rates on similar or analogous articles and considering value as a factor in determining whether the articles are analogous or not. The operation of this principle, however, generally results in forcing low rates on low-grade commodities rather than compelling high rates on high-grade commodities.

In recent years, the ability of the railroads to adhere to the value-of-service principle, insofar as it results in high rates on valuable articles, has been seriously impaired because of the rise of competing forms of transportation, particularly motor transport. In 1934 the Federal Coordinator's Section of Transportation Service stated: "Common-carrier motortrucks use railroad classification methods generally only when compelled to do so by regulatory orders."[85] It was also pointed out that truck lines sometimes charged flat rates which had no relation to the rail classification or charged a flat rate for articles in the first three rail classes. Thus, the common-carrier truck lines were inclined to disregard fine calculations of what rate a particular article could be made to stand because the high degree of competion in the motortruck industry led to a greater emphasis on cost-of-service factors. The ex-

[79] *Report of Committee appointed Sept. 20, 1938, by the President of the United States to submit Recommendations upon the Transportation Situation*, pp. 14–15.

[80] *Reduced Rates, 1922*, 68 I. C. C. 676; *Fifteen Per Cent Case, 1931*, 178 I. C. C. 539.

[81] See particularly *Passenger Fares and Surcharges*, 215 I. C. C. 673 (1936); *Eastern Passenger Fares in Coaches*, 227 I. C. C. 17 (1938), 227 I. C. C. 685 (1938).

[82] Sharfman, I. L., *The Interstate Commerce Commission*, pt. III-B, p. 296.

[83] *Second Annual Report of the Interstate Commerce Commission, 1888*, p. 35; *Schumacher Milling Co. v. Chicago, Rock Island and Pacific R. R. Co.*, 4 I. C. R. 373, 377 (1893).

[84] Sharfman, I. L., *The Interstate Commerce Commission*, Part III-B, pp. 489–490.

[85] *Merchandise Traffic Report*, p. 6, note 71.

istence of high rail rates and ratings on valuable articles explains much of the loss of high-class less-than-carload traffic by the railroads. Today common carriers by motor vehicle generally use freight classifications, and in most instances these classifications are the same as, or follow closely, the rail classifications. In New England, however, an attempt was made to build motor-freight classifications on cost-of-service principles. Even where the motor carriers copy rail-classification methods and charge rail rates, a large amount of the high-grade traffic tends to move by highway because of service advantages.

The extent to which railroads have attempted to readjust their rates on high-valued articles by reductions in classification ratings, by exceptions to the classifications, or by the creation of a larger number of commodity rates, cannot be readily ascertained. Recent reductions in approximately 3,500 classification ratings on less-than-carload traffic in Southern Territory, and between Southern Territory and Official and Western Territories represent an effort on the part of the railroads to recover much of the less-than-carload traffic which had been lost to motortrucks and to freight forwarders. One characteristic of these reductions was that quite generally less-than-carload rates higher than third class were reduced to third class in disregard of certain differences in value characteristics.

Certain devices which represent a break-down of the traditional rate-making scheme have been used by the railroads for some time, however, to meet motortruck competition. The most common device of this sort is the "all-freight" or "all-commodity" rate. These rates, usually on carloads, apply on all commodities, with certain exceptions, regardless of the ratings provided by the freight classification. They were introduced about 1932. The first all-freight rates were 70 percent of first class but now commonly range from 36 to 50 percent of the first class. The chief users of all-freight rates are the freight forwarders, but it should be recognized that the patrons of the freight forwarders are indirect beneficiaries. Since the all-freight rates are usually carload rates they cannot be compared with the rates that may have formerly been charged under the classification ratings on the same articles in less than carloads. All-freight rates do, however, disregard differences in the value of the articles moving under these rates.

All-freight rates first came before the Commission officially in 1937 in *Freight from Boston to East Hartford*,[86] and received the Commission's approval. They were also approved in a number of other cases.[87] Certain features of all-freight rates have been condemned and the rates restricted to prevent abuses.[88] In some instances the Commission has spoken approvingly of all-freight rates, pointing out that they had been helpful in enabling the railroads to hold merchandise traffic to their lines and in regaining some which had been previously lost to motor carriers.[89] The Commission seems to have been somewhat more reluctant to approve of all-freight rates for motor carriers than for rail carriers. In a number of motor-carrier cases the Commission has disapproved of such rates, particularly when applied on less-than-truckload shipments, or when published as any-quantity rates.[90] In numerous cases, however, all-freight rates have been specifically approved for motor carriers.[91] Some recent decisions suggest that Division 3 of the Commission looks with distrust at all-freight rates of both motor carriers and railroads,[92] while the Commission as a whole will approve of them.[93]

Individual commissioners have expressed opposition to all-freight rates.[94] Other Commissioners have defended all-freight rates, or cautioned against any disapproval of them which is based merely on the grounds that they are not in conformity with traditional methods of rate making.[95]

Distrust of all-freight rates is based on the fact that they disregard the traditional principles of rate making and threaten to break down existing freight classifications. To the extent that all-freight rates disregard value of service in rate making and reduce rates on high-

[86] 223 I. C. C. 421 (1937).

[87] *All Freight from Chicago and St. Louis to Birmingham*, 226 I. C. C. 455 (1938); *Commodities between Chicago, Ill., and Twin Cities*, 226 I. C. C. 356 (1938); *All Freight between Boston and Maine Railroad Points*, 226 I. C. C. 387 (1938); *All Freight Between Harlem River, N. Y., and Boston*, 234 I. C. C. 673 (1939); *All Freight to Pacific Coast*, 238 I. C. C. 327 (1940).

[88] *Freight Forwarding Investigation*, 229 I. C. C. 291 (1938); *Middle Atlantic States Motor Carrier Conference, Inc.*, v. *Central R. R. Co. of New Jersey et al.*, 232 I. C. C. 381 (1939).

[89] *All Freight from Chicago and St. Louis to Birmingham*, 226 I. C. C. 455 (1938).

[90] *Central Territory Motor Carrier Rates*, 12 M. C. C. 143, 170–171 (1939), 17 M. C. C. 543, 544 (1939); *Chicago and Wisconsin Points Proportional Rates*, 10 M. C. C. 556 (1938), 17 M. C. C. 573 (1939); *All Commodity Rates over Interstate Motor Freight Systems*, 13 M. C. C. 24 (1938); *All Freight from and to Lincoln and Omaha, Nebr.*, 26 M. C. C. 634 (1940).

[91] *Freight, All Kinds, between Denver, Colorado, and Wyoming*, 20 M. C. C. 5 (1939); *Central Territory Motor Carrier Rates*, 21 M. C. C. 677, 679 (1940); *All-Freight between Los Angeles and Albuquerque*, 28 M. C. C. 161 (1941).

[92] See *All-Freight, Chicago & St. Louis to El Paso, Tex.*, 28 M. C. C. 7271 (1941), and *All-Freight, Eastern Ports to South*, 245 I. C. C. 207 (1941).

[93] *All Freight to Pacific Coast*, 248 I. C. C. 73.

[94] See dissenting opinion of Commissioner Alldredge in *All-Freight Between Harlem River, N. Y., and Boston*, 234 I. C. C. 673, 676 (1939); and in *All-Freight between Los Angeles and Albuquerque*, 28 M. C. C. 161, 167 (1941). See also Commissioner Caskie's doubts as to the lawfulness of such rates in *Freight, All Kinds, Between Denver, Colorado, and Wyoming*, 20 M. C. C. 5, 7 (1939).

[95] See separate statement of Commissioner Eastman on *Central Motor Carrier Rates*, 17 M. C. C. 543, 548 (1939), and in *Chicago and Wisconsin Points Proportional Rates*, 10 M. C. C. 556, 570 (1938), and statement of Commissioner Mahaffie in *Middle Atlantic States Motor Carrier Conference, Inc.*, v. *Central R. R. Co. of New Jersey et al.*, 232 I. C. C. 381, 405–415 (1939).

grade articles, they are not objectionable but merely indicate the passing of a situation which enabled railroads to exploit their semimonopoly position. All-freight rates, however, disregard cost-of-service as well as value-of-service factors that have been recognized in freight classification. This would suggest that all-freight rates might be restricted to articles for which costs of transportation are not greatly different or that such cost-of-service factors as weight, density, susceptibility to loss and damage, and the insurance element might be taken care of in a different way instead of through the medium of the classification.

The all-freight or all-commodity rate is not the only device which has been used by the railroads to recover traffic lost to trucks. Rates on loaded trucks, trailers, or semitrailers were authorized by the Interstate Commerce Commission in *Trucks on Flat Cars Between Chicago and Twin Cities*.[96] The rates in this instance were flat rates, regardless of the contents of the car. Rates on loaded trucks and trailers, however, are not common. Rates provided in connection with the "container service" of the railroads exhibit the same tendency to disregard traditional freight classification.[97] The first all-freight or all-commodity rates are said to have been originated by certain railroads as a means of meeting competition of other railroads which were providing a container service with flat rates. All-freight rates and similar devices have been effective in recovering some traffic to the rails.

During the time that railroads have been developing all-freight rates and other devices which represent a breaking down of the old system of rate making, opposite tendencies have been at work also. Motor carriers have more and more adopted the rate-making practices of the railroads. The efforts of common carriers by motor vehicle to copy rail classifications and rates, however, is made difficult by the existence of contract carriers. To overcome this difficulty efforts are frequently made to restrict the operations of contract carriers or to force them to charge common-carrier rates. But even if contract carriers were brought into line and made to charge common-carrier rates, private transportation would interfere to some extent with the ability of railroads and motor carriers to maintain the tradition system of rate making. Already there are intimations of concern over the development of private transportation and of efforts to restrict it.[98]

Efforts to extend old patterns of railroad rate making to motor carriers cannot be wholly successful unless contract and private carriers are in some way restricted. Such efforts would appear to be contrary to the public interest. They would tend to deprive the public of benefits which the newer forms of transportation have made possible. If resort to contract carriers and private carriage is not restricted, but common carriers by motor vehicle are required to adopt the rail pattern of rates, then the inherent advantages of motor transport are denied to those who must patronize the common carriers by motor vehicle; but are extended to those who can make use of contract carriers, or can perform their own transportation. This discrimination against the patrons of common carriers by motor vehicle can best be eliminated by permitting motor-carrier rates to find the level that competition would normally establish, i. e., rates that reflect costs of transportation by motor vehicle, and not an assumed ability of certain traffic to pay higher transportation charges.

A policy of permitting railroads to adjust their rates to the new competitive situation would reduce to a minimum the financial losses that railroad owners and investors will have to suffer. It would also tend to discourage an unnecessary expansion of highway transport, since the practice of maintaining high rail rates on high-grade traffic enables truckers to operate profitably even where their costs are higher than rail costs. If rail rates on high-grade traffic were reduced to conform more nearly to rail costs, truckers would be forced to confine themselves to operations for which their costs are lower than rail costs, or where superior service offsets the lower rail rates.

Relation of rates to size of shipment.—It has been pointed out that for many years the railroads have made a difference in the rates on carload and on less-than-carload shipments. Early in the history of the Commission the propriety of a difference in rates on carload than on less-than-carload quantities came up for consideration. The Commission approved of such differences in rates.[99] The Commission, however, was reluctant to require the establishment of carload rates.[1] As late as 1910 the Commission could say that it had never ordered the establishment of lower rates on carloads than on less-than-carloads.[2] In more recent years the Commission has sometimes found an any-quantity rate unreasonable, insofar as it applied to carload lots.

[96] 216 I. C. C. 435 (1936).

[97] See *In the Motter of Container Service*, 173 I. C. C. 377 (1931), 185 I. C. C. 787 (1932).

[98] See B. H. Meyer, "Transportation Viewpoints," 51 *Proceedings of the Western Railway Club* 22 (1939); Ware, Wallace L., Address before Associated Traffic Clubs in San Francisco (1939); Willette, F. P., Address before the National Wholesale Hardware Association at Atlantic City (1940); and at least one organization has been formed to combat private transportation—Distributors Transportation League.

[99] *Wm. Scofield* v. *Lake Shore & Michigan Southern R. R. Co.*, 2 I. C. R. 67 (1888); *Thurber* v. *New York Central & Hudson River R. R. Co.*, 2 I. C. R. 742 (1890).

[1] *Brownell* v. *Columbus & Cincinnati Midland Ry. Co.*, 4 I. C. R. 285 (1893).

[2] *Commercial Club of Omaha* v. *Baltimore & Ohio R. R. Co. et al.*, 19 I. C. C. 397, 401 (1910).

This virtually amounts to requiring the establishment of carload rates.[3]

The justification for lower carload rates is the lower cost of transporting goods in carloads than in less-than-carloads. Lower billing costs, the fact that loading and unloading is performed by the shipper and consignee, less terminal expense per car, and other factors are ordinarily held to justify the lower carload rates.

Multiple-carload rates.—If lower rates on carloads than on less-than-carloads can be justified on the basis of lower costs of providing the service, it would seem that lower rates on trainloads, or multiple carloads, than on carloads would also be justified to the extent that lower costs can be shown. Until recently, however, the Commission was inclined to look unfavorably on such rates because they could be used by only a limited number of shippers and would tend to favor large shippers.[4]

The competition from pipe lines, barges, and coastwise and intercoastal vessels has given rise to the suggestion that railroads establish such "cargo" rates. The Federal Coordinator's Section of Transportation Service recommended their establishment. The argument that those rates would discriminate against small shippers did not impress the Coordinator's staff because frequently the large shipper already obtains low-cost transportation by pipe line or by providing himself with fleets of vessels.[5]

Multiple-car rates on sand and gravel were approved by the Michigan Public Utilities Commission, with a minimum of 15 cars, in 1935.[6] In 1939 the Interstate Commerce Commission allowed multiple carload rates to go into effect on blackstrap molasses in tank cars from New Orleans and Harvey, La., to Peoria and Pekin, Ill. The rates authorized were 15 cents per hundred pounds subject to a minimum of 1,800 tons, the equivalent of about 38 cars, as compared with a rate of 17.5 cents in carload lots. The Commission found that the cost of handling the traffic in carloads was about 10 percent greater than in 38-car lots.[7] Since the Commission's decision in the *Molasses* case multiple-car rates have been established in a few other instances. A multiple-car rate of $2.00 per ton, minimum 2,000 tons, applies on coal from Fort Smith, Ark., to St. Louis, Mo. There is a rate on concrete aggregates from Oxford, Mich., to Detroit, subject to a minimum of 25 carloads; and a rate on concentrated bauxite ore from Mobile, Ala., to Vancouver, Wash., subject to a minimum of 1,800 tons.[8] The Commission has, in one case, refused to require the establishment of trainload rates.[9]

Graduated quantity rates.—Although railroads have long maintained different rates on carloads and on less-than-carloads, there has not been, until recently, any attempt to provide rates graduated according to the size of less-than-carload shipments. The shipper, therefore, has been compelled to pay the comparatively high less-than-carload rate on shipments of considerable size (although constituting less than a carload) or else pay the carload rate on the minimum carload weight.[10] To meet the competition of motor carriers the railroads have begun to establish rates of this nature. This feature is often found in the all-freight or all-commodity rates.[11] In *Rates between Arizona, California, New Mexico, and Texas*, the railroads and motor carriers put into effect a system of class rates in which the basic rates applied on shipments of less than 5,000 pounds.[12] On shipments weighing from 5,000 to 10,000 pounds the rates were 10 cents lower, and on shipments weighing 10,000 pounds or more the rates were 20 cents lower than the basic rates. The reduction of 10 cents and 20 cents for the larger-sized shipments were made on the theory that there was a saving of approximately these amounts, on the part of the motor carriers at least, in handling the larger quantities. In the *Freight Forwarding Investigation* the Commission suggested that it might be well for the railroads to inaugurate a more efficient service for less-than-carload traffic which would be handled under a basis of "graduated quantity rates" or volume rates.[13]

More recently the Santa Fe and other railroads put into effect a system of graduated less-than-carload class rates between certain points in the Southwest.[14]

Graduated quantity rates represent an attempt to meet competition of trucking concerns which have quite generally adopted this scheme of rate making. They may also be effective in meeting the competition of

[3] *Auto Vehicle Co.* v. *Chicago, Milwaukee & St. Paul Ry. Co. et al.*, 21 I. C. C. 286 (1911); *In re Transportation of Wool, Hides, and Pelts*, 23 I. C. C. 151, 168–169 (1912); *Brunswicke-Balke-Collender Co.* v. *Chicago Great Western R. R. Co. Director General et al.*, 56 I. C. C. 340 (1920); *Interstate Cottonseed Crushers' Assoc.* v. *Director General, Alabama & Vicksburg Ry. Co. et al.*, 61 I. C. C. 1 (1921).

[4] *Paine Bros. & Co.* v. *Lehigh Valley R. R. Co.*, 7 I. C. C. 218 (1897); *Carstens Packing Co.* v. *Oregon Short Line R. R. Co.*, 17 I. C. C. 324, 328 (1909); *Anaconda Copper Mining Co.* v. *Chicago & Erie R. R. Co.*, 19 I. C. C. 592, 596 (1910); *Woodward-Bennett Co.* v. *San Pedro, Los Angeles & Salt Lake R. R. Co.*, 29 I. C. C. 664 (1914); *J. W. Wells Lumber Co.* v. *Chicago, Milwaukee & St. Paul Ry. Co.*, 38 I. C. C. 461 (1916); *Miller & Lux, Inc.*, v. *Southern Pacific Co.*, 41 I. C. C. 617 (1916).

[5] *Freight Traffic Report*, vol. II, pp. 91–92.

[6] *In the Matter of The Complaint of the Michigan Trucking Association et al., against Certain Sand and Gravel Tariffs*, Orders and Opinions, Michigan P. U. Com., 1935, p. 406.

[7] *Molasses from New Orleans, La., to Peoria and Pekin, Ill.*, 235 I. C. C. 485 (1939).

[8] 243 I. C. C. 589, 546 (1941).

[9] *Petroleum Rail Shippers' Assn.* v. *Alton & Southern R. R. Co.*, 243 I. C. C. 589 (1941).

[10] See p. 91, *supra*.

[11] See *Commodities between St. Louis District and Missouri*, 234 I. C. C. 425 (1939).

[12] 3 M. C. C. 505 (1937).

[13] 229 I. C. C. 201, 301 (1938).

[14] *Commodities between El Paso, Tex.; Colorado; and New Mexico*, 237 I. C. C. 113 (1940).

freight forwarders since they tend to reduce the spread between less-than-carload and carload rates on which freight forwarders thrive.

Quantity rates and multiple-car rates represent an adjustment in rates to meet new competitive situations and should be of some help to the railroads in recouping traffic lost to other transportation agencies. They should be encouraged if properly policed to prevent unjust discriminations.

Control of Competition—The Minimum-Rate Power

The intensification of competition in transport resulting from the rise of motor-vehicle transportation and from the increasing importance of water transportation and pipe lines has brought about increased resort to minimum rate regulation as a means of controlling competition. The use of this power to interfere with the processes of free competition has been viewed with distrust by many persons who have feared that it would result in an effort to "cartelize" the transport industry. The minimum-rate power is a power that might easily be abused or unwisely exercised. For this reason it may not be out of place to review the policies of regulatory authorities in the exercise of this power.

Minimum-rate regulation—Railroads.—The Interstate Commerce Commission has had power to prescribe minimum reasonable rates for railroads since 1920. There was little controversy over the wisdom of granting this power to the Commission. The tendency for railroad competition to become "ruinous" or "cutthroat" in nature had long been recognized. It was forcefully demonstrated by President Hadley, of Yale University, prior to the enactment of the Act to Regulate Commerce.[15]

The Commission may exercise its minimum-rate power as a result of complaints brought before it that some rate is unreasonably low, but more often it is exercised as a result of a suspension proceeding, that is, a case in which rates proposed by railroads have been suspended pending an investigation of their lawfulness. If the proposed rates represent reductions they are often opposed by rival carriers or by parties which would be adversely affected by the resulting change in rate relationships. In classifying the circumstances under which the Commission will prescribe minimum rates or find proposed reductions not justified, and in citing illustrative cases, it should be recognized that frequently two or more circumstances combine to justify the exercise of the minimum-rate power.

Generally speaking, the Commission has exercised its power to limit or restrict rate reductions with caution. As early as 1922 the Commission said: "We believe * * * that this power should be sparingly exercised and only in cases where it clearly appears that its exercise is necessary in order that substantial public injury may be avoided."[16] Similar statements have been made by the Commission many times since.[17]

An examination of a substantial number of cases in which the Commission has interfered with rate reductions reveals the following situations which will call forth the exercise of the minimum-rate power or will cause the Commission to disapprove reductions proposed by the railroads:

1. The Commission will interfere to prevent noncompensatory rates or rates which are barely compensatory. The term "compensatory" although not precisely defined carries some of the meaning, at least, associated with the term "reasonably compensatory" found in section 4 of the act (the long-and-short-haul clause) and defined by the Commission in *Transcontinental Cases of 1922.*[18] Rates are not compensatory unless they cover, and more than cover, the out-of-pocket expenses of providing the service in question. This means, of course, that they may be compensatory even though considerably below "reasonable" or normal rates on the article in question. The Commission does not hesitate to condemn rates which are so low as to be noncompensatory, or barely compensatory.[19] Even in these cases, however, the Commission is inclined to resolve in the carrier's favor any doubts as to the compensatory character of the rates.[20]

2. Although the Commission will condemn noncompensatory rates as too low it will sometimes find rates "unreasonably low" when they are compensatory in the sense that they cover direct or out-of-pocket costs, but are nevertheless low in comparison with rates on similar traffic, or yield less revenue than seems appropriate.[21] Other circumstances which also justify interference with the proposed rates are usually found in cases of this type. This standard of reasonableness suggests that the adequacy of the rates is to be determined by the process of comparing them with other rates on similar traffic—the usual procedure when maximum reasonable rates are to be determined. In *Salt Cases of 1923* the Commission

[15] See A. T. Hadley—*Railroad Transportation* (1885).

[16] *Sugar Cases of 1922*, 81 I. C. C. 448, 472 (1923).

[17] E. g., *Ex-Lake Iron Ore from Chicago to Granite City, Ill.*, 123 I. C. C. 503, 504 (1927); *H. Moffat Co. v. Southern Pacific Co.*, 195 I. C. C. 198, 202 (1933); *Anchor Storage Co. v. Alton R. R. Co.*, 211 I. C. C. 307, 309 (1935); *Inland Empire Paper Co. v. Great Northern Ry. Co.*, 219 I. C. C. 501, 510 (1936).

[18] 74 I. C. C. 48, 71 (1922).

[19] *Cocoanut Oil from Pacific Coast to East-bound Transcontinental Destinations*, 167 I. C. C. 599 (1930); *Ex-Lake Grain to North Atlantic Ports*, 235 I. C. C. 415 (1939).

[20] See *Bunker Coal from Alabama Mines to Gulf Ports*, 227 I. C. C. 485 (1938), and *Barium, St. Louis to Eastern Points*, 209 I. C. C. 140, 144 (1935).

[21] See *Cotton Piece Goods in The South*, 234 I. C. C. 525 (1938); *Sash and Doors from Pacific Coast to New York, N. Y.*, 81 I. C. C. 279 (1923); *Lehigh Stone Co. v. Baltimore & Ohio R. R. Co.*, 222 I. C. C. 281 (1937).

asserted that it could use tests of the same character as are used in determining maximum reasonable rates.[22] This means that rate comparisons, and comparisons of earnings per car, per car-mile, and per ton-mile are pertinent. It should not be inferred, however, that minimum reasonable rates and maximum reasonable rates are the same thing. The Supreme Court of the United States has said that there is a "zone of reasonableness" between maxima and minima "within which a carrier is ordinarily free to adjust its charges for itself."[23] The Commission, in thousands of cases, has permitted the railroads to maintain low rates to meet competition.

3. Minimum rates may be prescribed, or rate reductions disapproved, even though the rates themselves are not below a reasonable minimum, if they result in the creation of undue preference and prejudice or unjust discrimination. Cases are very numerous in which proposed reduced rates have been condemned for this reason.[24]

4. Closely allied with the above are cases which arise under section 13 of the Interstate Commerce Act, i. e., cases which involved a level of intrastate rates so much below interstate rates as to create unjust discrimination against interstate commerce.[25]

5. Minimum rates are frequently prescribed. or proposed reductions are disapproved, when collateral losses of revenue to the carriers proposing the rates seem likely to offset revenue from new traffic to be obtained by the reduced rates. This frequently happens when reductions are proposed for competitive reasons, even though a considerable volume of traffic moves by the carrier in question at the higher rates. Cases are not difficult to find in which rate reductions have been prevented because of the collateral losses.[26] The Commission recognizes, however, that the question of whether a reduction in rates on particular items of traffic will increase or reduce revenues cannot be determined with certainty. Since the question is one which is primarily within the province of management, the Commission is not likely to interfere on the grounds that the revenue results are uncertain.[27]

6. The Commission will condemn rates which are reduced to meet competition if they are lower than necessary to meet the competition encountered. Cases are very numerous in which minimum rates have been prescribed, or reductions denied, because proposed rates were lower than necessary to meet competition.[28] In cases of this type doubts as to whether the proposed rates are lower than necessary to meet competition may be resolved in favor of the carrier proposing the rates,[29]

7. Lastly, the Commission sometimes exercises the minimum-rate power to prevent rate wars, or what amounts to nearly the same thing, to prevent the disruption of an established rate structure which is deemed to be reasonable. This is done in order to prevent the loss of revenues which would result when a chain of reductions is started. The Commission early asserted that its power over minimum rates might be exercised for this purpose.[30] This interpretation of the Act has been approved by the courts, which have recognized the close connection between the minimum-rate power and the Commission's obligation under section 15a of the act to maintain a rate level, so far as possible, that is adequate to support the railroad system.[31] The cases are numerous in which the Commission has interfered with rate reductions or prescribed minimum rates for the purposes of preventing the break-down of a rate structure deemed to be reasonable.[32]

The decision of the Supreme Court of the United States in 1935 in *United States* v. *Chicago, Milwaukee, St. Paul & Pacific R. R. Co.* forced a critical reexamination and reconsideration of the Commission's use of the minimum-rate power to protect an existing rate structure. An order of the Commission was set aside in which the Commission had refused to authorize certain reductions in rates on coal on the grounds that they would disrupt the rate structure. The Court held that "such a disruption without more is no sufficient reason

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[22] 92 I. C. C. 388, 410 (1924).

[23] *United States* v. *Chicago, Milwaukee, St. Paul & Pacific R. R. Co.*, 294 U. S. 499, 506 (1935).

[24] E. g., *Arkansas Jobbers & Manufacturers Assoc.* v. *Director General, Chicago, Rock Island & Pacific Ry. Co. et al.*, 59 I. C. C. 662 (1920); *Coffee, Roasted, in the Southeast*, 225 I. C. C. 271 (1937); *Lumber from Decatur, Ala., to Gulf Ports*, 226 I. C. C. 164 (1938); *Heating Apparatus between Western Trunk Line Points*, 232 I. C. C. 641 (1939); *Whiskey from Frankfort, Ky., to Lawrenceburg, Ind.*, 241 I. C. C. 465 (1940).

[25] E. g., *Intrastate Rates on Bituminous Coal between Points in Illinois*, 182 I. C. C. 537 (1932); *Southwark Mfg. Co.* v. *Pennsylvania-Reading Seashore Lines*, 231 I. C. C. 755 (1939); *Class Rates within the State of Ga.*, 209 I. C. C. 586 (1935).

[26] See *Trunk-Line and Ex-Lake Iron Ore Rates*, 69 I. C. C. 589, 610 (1922); *All Freight between Portland and Seattle*, 238 I. C. C. 729 (1940).

[27] *Lumber from Pacific Coast to Eastern Points*, 210 I. C. C. 317, 346 (1935).

[28] *Gasoline from San Francisco Bay Points to Ogden, Utah*, 198 I. C. C. 683, 699 (1934); *Coal from Illinois to Keokuk, Iowa*, 210 I. C. C. 395, 400 (1935); *Coal from Smithfield, Ohio, to the Ohio River*, 209 I. C. C. 399, 408 (1935); *Lehigh Stone Co.* v. *Baltimore & Ohio R. R. Co.*, 222 I. C. C. 281, 283 (1937); *Petroleum between Washington, Oregon, Idaho, and Montana*, 234 I. C. C. 609 (1939); *Sugar from Port Wentworth, Ga., to Tampa, Fla.*, 241 I. C. C. 667 (1940).

[29] See *Malt Liquors from New Orleans to Texas Points*, 277 I. C. C. 439, 447 (1938).

[30] See *Trunk-Line and Ex-Lake Iron Ore Rates*, 69 I. C. C. 589, 611 (1922).

[31] See *Anchor Coal Co.* v. *United States*, 25 F. (2d) 462, 471–472 (1928), and especially *Jefferson Island Salt Mining Co.* v. *United States*, 6 F. (2d) 315, 317–318 (1925).

[32] *Salt Cases of 1923*, 92 I. C. C. 388, 412 (1924); *Grain and Grain Products from Kansas and Missouri to Gulf Ports*, 115 I. C. C. 153, 164 (1926); *Cement in Carloads from Linwood, Iowa, to Points in Illinois*, 140 I. C. C. 579, 682 (1928); *Coal Bituminous Ex-River, from Colona and Conway, Pa., to Youngstown, Ohio*, 197 I. C. C. 617, 634 (1933); *Coal from Kansas and Missouri to Missouri via M.-K.-T. R. R. Co.*, 198 I. C. C. 535 (1934); *Intrastate Rates on Bituminous Coal between Points in Illinois*, 206 I. C. C. 120, 124 (1934); *Shoes from Jacksonville, Fla., to Quitman, Ga.*, 225 I. C. C. 732, 734 (1938); *Export Grain, C. F. A. Territory to North Atlantic Ports*, 235 I. C. C. 655, 672 (1940).

for prohibiting a change."[33] There is an implication in the opinion, however, that a disruption of the rate structure which was clearly shown to impair revenues of the carriers could properly be stopped by the Commission, and the opinion also makes it clear that when an existing rate structure has been specifically found just and reasonable the minimum-rate power may be exercised to prevent its disruption. A few weeks after the above decision was handed down the Court upheld another order of the Commission in which minimum rates had been prescribed to preserve the rate structure.[34] The Court distinguished the case from the earlier one by pointing out that in the Milwaukee case the existing rate structure had not been specifically found just and reasonable, while in the Youngstown case the threatened rate structure had been approved.

It should be noted that the Commission will not exercise this power for the purpose of settling disputes between competing shippers over their markets when no undue preference or prejudice under section 3 exists. In *Sugar Cases of 1922* the Commission said: "We are really being asked * * * to fix such rates for the purpose of giving each refining point what we may deem to be its 'fair share' of the sugar business in the destination territory under consideration, a purpose which considered alone rather than as a mere incident of other purposes, clearly does not justify the use of this power."[35] A minimum-rate order of the Commission was set aside by a court in *Anchor Coal Co.* v. *United States*[36] on the grounds that the Commission had (although the Commission stoutly denied it) prescribed rates for the purpose of dividing markets between competing producers,[37]

By way of concluding the examination of the Commission's exercise of its power to prevent or to limit voluntary rate reductions by railroads, it may be observed that the exercise of this power in the seven general classes of cases noted above does not seem inappropriate. Of course, cases are bound to arise in which the wisdom of interfering or not interfering is problematical, and differences of opinion will necessarily appear.[38] The Commission has, however, exercised its powers with restraint, and it has not attempted to freeze the rate structure, nor has it unduly interfered with the efforts of the railroads to make reasonable competitive adjustments in rates.

Minimum rate regulation—Motor carriers.—The Motor Carrier Act of 1935 gave the Interstate Commerce Commission the power to prescribe minimum as well as maximum reasonable rates of common carriers by motor vehicle, and the power to prescribe minimum rates of contract carriers by motor vehicle. Doubts have been expressed, from time to time, of the necessity of giving the Interstate Commerce Commission this power over the rates of motor carriers, and fear has been expressed that the power may be abused. The argument that minimum rate regulation was unnecessary rests upon the contention that the motor-carrier industry is a naturally competitive industry, in contradistinction to the railroad industry which is naturally monopolistic. It is reasoned that the ease with which one may enter and leave the industry, the small units of operation, and the absence of a large mass of constant or overhead costs in the industry should enable the supply of facilities to adjust itself to the traffic and prevent either "ruinous" competition, or excessive rates. Fear that the power to prescribe minimum rates will be abused is based on the realization that powerful pressures will be exerted to keep motor-carrier rates above a truly competitive level in an effort to protect high-cost carriers by motor vehicle and perhaps to protect railroads. No final answer can be given to the question of the wisdom or necessity of minimum rate regulation from the limited experience which has been had. Any consideration of the question, however, should be made in the light of such experience as is available. For this reason an effort has been made to discover the principles and policies observed by the Commission in prescribing minimum rates for motor carriers to the extent that they are observable in the Commission's decisions. A much more thorough analysis is desirable than it has been possible to undertake in connection with this study.

In five important territorial-rate cases the Commission has prescribed minimum motor-carrier rates over large areas to put a stop to what it considered to be excessive rate cutting and ruinous competition.[39] The Commission's action in these cases was to establish as minima, in most instances, the rates which the motor carriers, through their "conferences" or "associations" had agreed upon. Many of the rates prescribed as minima, furthermore, were the same as the rail rates or were made in definite relation thereto. This action of the Commission naturally aroused the suspicions of those who had feared that motor-carrier regulation would deprive the public of such low-cost transportation as the development of highways and motor-vehicle transportation had brought them. It should be recognized, however, that in the territorial cases the Com-

[33] 294 U. S. 499, 507 (1935).

[34] *Youngstown Sheet and Tube Co.* v. *United States*, 295 U. S. 476 (1935).

[35] 81 I. C. C. 448, 472 (1923).

[36] 25 Fed. (2d) 462 (1928).

[37] See also pp. 125–126, *infra*.

[38] For a case in point see *Lake Cargo Coal from Illinois, Indiana, and Kentucky to Chicago*, 238 I. C. C. 633 (1940).

[39] *Middle Atlantic States Motor Carrier Rates*, 4 M. C. C. 68 (1937); *New England Motor Carrier Rates*, 8 M. C. C. 287 (1938); *Central Territory Motor Carrier Rates*, 8 M. C. C. 233 (1938); *Trunk Line Territory Motor Carrier Rates*, 24 M. C. C. 501 (1940); *Midwestern Motor Carrier Rates*, 27 M. C. C. 297 (1941).

mission was confronted with situations which it considered of an emergency nature requiring prompt action. The Commission felt that action could not wait for a careful examination of particular rates, or a careful analysis of motor-carrier costs. In the Middle Atlantic case the Commission said: "The record shows plainly that the motor carriers here concerned found themselves in a competitive struggle which was undermining their rates and depleting their revenues at a time when costs of operation were rising rapidly. Their reserves, to the extent that they had any, were nearing exhaustion and financial ruin loomed ahead." [40] Through cooperative action some agreement had been reached within the industry but in order to bring all carriers into line and to prevent demoralization of the rates the exercise of the minimum-rate power seemed necessary to the Commission. This put a bottom under the rates, and provided a basis from which to begin the process of working out a sound motor-carrier rate structure.

In the Central Territory case the Commission found the gross revenues of the respondent motor carriers to be inadequate. In some instances they were barely equal to operating expenses, but in most instances they were considerably less. The Commission summed up the situation by saying: "The evidence of respondents, members of the Bureau (the Central States Motor Freight Bureau) reveals that the motor-carrier industry in this territory is in a demoralized condition, due principally to conflicting rates and practices, the lack of unity of action among respondents, and continuing rate wars." [41] The Commission was convinced that a minimum-rate order was essential in order to eliminate unfair and destructive competition and to provide for adequate and dependable service. A somewhat similar situation existed in New England.[42] In the Truck Line Territory case the Commission prescribed minimum rates for the same reason, but the emergency nature of the situation was not as clear, and Commissioner Joseph B. Eastman was not convinced that a minimum rate order was necessary.[43] The demoralized condition of the motor-carrier industry due to rate wars was noted again in the Midwestern case, and the Commission pointed out that if further rate cutting was indulged in the operations of the motor carriers as a whole would be conducted at a loss.

In all of these cases the Commission disclaimed any intention of freezing the rates at the level prescribed, and in fact the Commission has by numerous supplemental orders in the above cases modified the original minima in hundreds of instances. In the Midwestern case the Commission said: "Once a floor has been laid under the existing rate structure, respondents state that they will proceed to ascertain costs and develop a symmetrical rate structure based as far as possible on cost factors. Respondents will be expected to act promptly in this respect." [44] Neither the wholesale prescription of minimum rates in these cases, nor the manner in which they were fixed, could be justified in the absence of a critical situation in the industry which required emergency action.

Proposals to modify motor-carrier rates on particular commodities or between particular points, if the ex parte investigations of large scope are excluded, come before the Commission in three ways. There are complaints that existing rates are unreasonable, usually that they are unreasonably low; there are suspension cases, which represent changes, usually reductions, proposed by the motor carriers and protested by competing motor carriers or railroads; and there are petitions to modify minimum-rate orders previously made, usually in the territorial investigations referred to above.

In these three types of cases an opportunity is afforded the Commission to give more attention to particular rates than in the territorial cases, where the need for quick action made it impossible to examine each individual rate. But even in these cases the Commission is breaking new ground, and its policies are not firmly established on many issues. The decisions may show a degree of inconsistency which often accompanies the development of policy through the decision of specific cases.

Some of the inconsistency in the decisions has resulted from changes in the view which has prevailed within the Commission on the matter of burden of proof in suspension proceedings. Nothing was said in the original Motor Carrier Act concerning burden of proof in rate-suspension cases. In the early cases, however, Division 5 of the Commission took the view that failure of a carrier to justify proposed reductions by showing that they were compensatory in character and consistent with its costs of operation was sufficient to warrant denial of the reductions.[45] Amendments to the Motor Carrier Act in 1938 placed upon the carrier in a suspension proceeding the burden of justifying a proposed increase in rates. No mention was made of the burden of proof if reductions in rates were proposed. In *Consolidated Freight Co. Commodities from Flint, Mich.*, a majority of the Commission took the position that the burden of proof was not upon a carrier to show that a reduced rate

[40] 4 M. C. C. 68, 77.

[41] 8 M. C. C. 233, 253.

[42] 8 M. C. C. 287, 319–320. See also *New England Territory Commodity Rates*, 8 M. C. C. 387 (1938).

[43] See 24 M. C. C. 501, 625–631 (1940).

[44] 27 M. C. C. 297 (1941).

[45] See *Rates over Carpet City Trucking*, 4 M. C. C. 589 (1938), and *Confectionery and Shoes over Reliable Transfer*, 11 M. C. C. 71 (1939).

was just and reasonable. Referring to the pertinent provisions of the Motor Carrier Act the Commission said: "We are unable to read into those provisions any requirement for a carrier affirmatively to show in an investigation and suspension proceeding in the first instance that a proposed reduced rate is just and reasonable, or any authority for us to find a proposed reduced rate to be unlawful merely because the respondent has not borne a supposed burden of justification." [46] The Commission further said: "Before we may enter an order requiring the cancelation of a proposed reduced rate we must be able to find definitely upon the record before us that the proposed rate is unreasonable, unjustly discriminatory, unduly prejudicial, or otherwise in violation of the act." [47] Following this decision reductions in motor-carrier rates were approved without proof that they were compensatory.[48] The situation has again changed, however, since the Transportation Act of 1940 has definitely placed the burden of justifying a reduction as well as an increase, in rates upon the respondent in a suspension proceeding.

The most common reason for interfering with rate reductions is the unremunerative character of the rate. The minimum-rate power is frequently exercised to prevent the establishment of a rate which would be "below a reasonable minimum" or noncompensatory. Just what constitutes compensatory or noncompensatory is not clearly defined.

Perhaps the most common situation which leads to the condemnation of a rate as below a reasonable minimum is one which can be justified only on an out-of-pocket-cost or added-traffic theory. The leading case on this point is *Refrigerator Material from Memphis, Tenn., to Dayton, Ohio.*[49] This case is often cited by the Commission, and the principle has been followed in numerous other cases[50] A possible exception to the rule laid down was noted. This was when the motor carrier was attempting to meet the competition of a railroad which maintained rates on an out-of-pocket-cost basis. "It must frankly be recognized," said the Commission, "that if the railroads are hereafter to be allowed to apply this theory in competing with the trucks, the latter must fairly be allowed equal leeway." [51] Such a situation arose in *Stoves from Alabama and Tennessee to Interstate Points.*[52] Here very low motor-carrier rates were authorized to meet the competition of railroads because the railroad rates were constructed on an out-of-pocket-cost basis. Commissioner W. M. W. Splawn, in a dissenting opinion in another case, has questioned the soundness of this policy. "That other carriers may maintain rates which are unreasonably low when measured by the accepted standards of rate making, in my opinion, certainly affords no ground for a finding that rates equally low are not unreasonable because necessary to meet competition of the carriers maintaining the depressed level of rates." [53]

One situation in which out-of-pocket cost rates can be most easily justified on economic grounds occurs when traffic moves predominantly in one direction and involves a return movement of empty vehicles. Low rates on the back haul are commonly deemed desirable for the purpose of obtaining some revenue from the back haul. The Commission, however, is not inclined to permit out-of-pocket cost rates even in this situation. In fact, the Refrigerator Material case, which established that rates would not be approved when they could be justified only on the out-of-pocket cost theory, was a case in which the low rates were proposed by the carrier in order to obtain revenue on back hauls. In numerous cases the Commission has refused to permit departure from the Refrigerator Material case principle in back-haul situations. [54] At first thought this position of the Commission seems inconsistent with its position in railroad cases where the propriety of lower rates in the direction of empty-car movement has long been recognized.[55] The reasoning of the Commission in the motor-carrier cases was revealed in the Refrigerator Material case where the commission said: "An unbalanced condition of truck traffic, because of the greater number of operators (as compared with railroads) is apt to be somewhat of an individual matter. That is to say, the traffic of one truck operator may preponderate in one direction, whereas that of a competing operator may preponderate in the other. As between operators, therefore, the application of the 'out-of-pocket' cost method of making rates might well result in a break-down of the rates in both directions." [56] The same reasoning has been repeated in other cases.[57] Whether the Commission would take a different position if the one-way movement of traffic was general in character has not been made clear. Perhaps the most sym-

[46] 21 M. C. C. 329, 331 (1940).

[47] *Ibid.*, p. 332.

[48] E. g., *Manufactured Iron and Steel Articles, Illinois, Indiana, Iowa, Pennsylvania*, 21 M. C. C. 569 (1940).

[49] 4 M. C. C. 187 (1938).

[50] E. g., *Grain Products from Lincoln, Nebr., to Illinois, Iowa, and Minnesota*, 22 M. C. C. 409 (1940); *Sugar from Colorado to Kansas and Missouri*, 18 M. C. C. 248 (1939).

[51] 4 M. C. C. 187, 190 (1938).

[52] 4 M. C. C. 641 (1938).

[53] *Wooden Chairs from Fort Smith, Ark., to St. Louis, Mo.*, 24 M. C. C. 447, 450 (1940).

[54] *D & H Motor Freight Commodities in N. J., N. Y., and Pa.*, 22 M. C. C. 389 (1940); *Paper Boxes from Lawrence, Kans., to Iowa Points*, 24 M. C. C. 63 (1940); *Mid-Western Motor Freight Tariff Bureau, Inc., v. Frank Eichholz*, 4 M. C. C. 755, 768 (1938); *Sugar from Colorado to Kansas and Missouri*, 18 M. C. C. 248 (1939).

[55] E. g., *Weil v. Pennsylvania R. R. Co.*, 11 I. C. C. 627, 630 (1906).

[56] *Refrigerator Material from Memphis, Tenn., to Dayton, Ohio*, 4 M. C. C. 187, 189 (1938).

[57] See *Iron and Steel Articles over T. C. Heffelfinger Estate*, 9 M. C. C. 611, 612–613 (1938).

pathetic statement made by the Commission toward low rates in the direction of empty-truck movement was made in a recent case where the Commission said: "We are not unmindful of the lawfulness and desirability of the efforts of the managers of common carriers to secure traffic to furnish lading for transportation units which would otherwise move empty. Such efforts necessarily tend toward the goal of transportation service to the public at the lowest cost consistent with the furnishing of such service. The result of finding remunerative back-haul traffic might well be the means for removing from the going heavy volume of traffic the burden of the cost of empty return movement and for bringing about true economy in operation." [58] In this case, however, the rates proposed were less than half the lowest rates previously maintained, and the Commission would not approve of them.

In determining the adequacy of proposed rates, the Commission relates them, if possible, to cost of service. The statement of the Commission that rates cannot be approved when they can only be justified on the out-of-pocket-cost basis implies that to be compensatory the rates should be related to the full allocated cost of service or to average costs. The Commission often condemns rates as below "cost" when the earnings per truck-mile under the proposed rates are below the carrier's costs per truck-mile.[59] Sometimes the cost figures relate to the specific traffic in question, but in some cases the costs are the average costs per truck-mile of the carrier or carriers proposing the reduced rates. The weight which may be attached to average costs of the carrier or carriers involved is shown in *Tallow from Tulsa, Okla. to Mo., Ind., and Ky.*, where the Commission said that a rate which yielded earnings less than the applicant's "average fully allocated costs cannot be said to be compensatory in the absence of any evidence to show that such admitted average costs are not representative for the particular movement under consideration." [60]

Insofar as costs are considered in territorial cases of wide scope the average costs of all carriers must be considered. In the Central Territory case the Commission said: "Necessarily, the rates which we prescribe are affected by cost and they must be based upon the average cost of all carriers handling the various kinds of traffic." [61] The question whether an individual carrier may justify lower rates than are generally maintained by a showing that the rates are compensatory to it is one which may cause much difficulty. In the Trunk Line case Commissioner Eastman said: "I am not wholly satisfied that a uniform rate structure for all the motor common carriers in this territory is desirable and in the public interest." [62] The effect of prescribing minimum rates over large areas is to prevent some rates which might be justified by the low costs of particular operators. The Commission, however, is not committed to uniformity in rates by all motor carriers competing for the same traffic or serving the same general area. In *McCormick Transfer, Commodities in Mass. and N. H.*, the Commission said: ". . . we are not warranted upon this record in finding the proposed rates to be unlawful merely because they are lower than those prescribed in *New England Motor Carrier Rates*." [63] A showing of the compensatory character of such rates to the carriers proposing them may be required in such instances. In *Packing House Products—Portland, Oreg.–Washington*, the Commission said: "Before we approve reduced rates for motor common carriers, which are lower than those maintained generally by other such carriers between the same points, we should have before us evidence that the proposed reduced rates will be reasonably compensatory for the service rendered. This requires, at the least, a statement of costs of operation by the carrier seeking to defend the lawfulness of such rates, since it is a matter within the knowledge of such carrier." [64] In other cases the Commission has followed the same principle.[65]

The importance attached to average costs, or fully allocated costs, suggests that these costs are of more significance in fixing minimum reasonable rates for motor carriers than in prescribing rates for railroads. The tendency of the Commission to approve railroad rates, particularly in competitive situations, when they yield something over out-of-pocket costs has been noted elsewhere. Since truck transportation costs vary more nearly with the amount of service performed than do railroad costs the greater significance apparently attached to average costs in the motor-carrier cases is natural and fully warranted.

The compensatory or noncompensatory character of proposed rates is not always determined by a consideration of costs of operation. The reasonableness of the rates may be determined by comparing them with rates of other motor carriers. They may be considered non-

[58] *Onions and Potatoes from North Dakota to Twin Cities*, 26 M. C. C. 153, 157 (1940).

[59] For examples of rates which were found to be below costs see *Tallow from Tulsa, Okla., to Mo., Ill., Ind., and Ky.*, 19 M. C. C. 751, 752–753 (1939); *Leather from Middleboro, Ky., to Chicago, Ill.*, 18 M. C. C. 265, 269 (1939); *Shellac, Liquid—Memphis, Tenn.–St. Louis, Mo.*, 17 M. C. C. 447 (1939).

[60] 19 M. C. C. 751, 752 (1939).

[61] 8 M. C. C. 233, 256 (1938).

[62] 24 M. C. C. 501, 631 (1940).

[63] 22 M. C. C. 385, 388 (1940).

[64] 17 M. C. C. 255, 258 (1939).

[65] *Wool and Mohair from Idaho and Wyoming to California*, 24 M. C. C. 794 (1940).

compensatory when out of line with rates of other motor carriers which are deemed reasonable.[66]

Although the adequacy of proposed rates is determined by rate comparisons or by a comparison of revenues per truck-mile under the proposed rates with average costs per truck-mile, the Commission does recognize the right of the motor carriers to adjust their rates to competitive conditions. We have already noted that even rates which can only be justified on an out-of-pocket-cost basis may be approved if they are necessary to meet the competition of other carriers which maintain out-of-pocket-cost rates. Rates below a normal basis have been authorized by the Commission to meet market competition.[67]

As in railroad minimum-rate cases, the Commission, with an eye to its duty to maintain rates which are adequate for the carriers involved, will deny rate reductions that threaten to cause rate wars or imperil a rate structure deemed reasonable. Minimum rates in the large territorial cases above referred to were prescribed for the purpose of stopping rate wars and the reduction of rates to unremunerative levels. The same threat may arise in rate cases of more limited scope.[68]

An examination of the decisions of the Interstate Commerce Commission under the Motor Carrier Act will not provide definitive proof that minimum rate regulation for motor carriers is necessary, if one is disposed to raise the question. A consideration of the leading territorial rate cases, however, does make it clear that the Commission was convinced that "ruinous competition" and destructive rate wars had developed in the motor-carrier industry, and that the prescription of minimum rates was necessary to ward off financial disaster to the motor carriers.

It is clear that the Commission will generally permit reductions in rates proposed by motor carriers if they are shown to be compensatory in character. In determining the propriety of reductions the Commission emphasizes the relation of the proposed rates to the costs of service by the carriers proposing them. This suggests that rates prescribed by the Commission conform with the standards of normal competition.

The Commission is solicitous of the adequacy of motor-carrier revenues, as the Act requires. The Commission has kept many rates from falling below a level which unrestricted competition would have temporarily brought about. Whether it has kept them higher than was necessary for the maintenance of adequate service is a question which cannot be definitely answered. It would be difficult to prove, however, that earnings of motor carriers have been excessive.

The Commission is skeptical of out-of-pocket-cost rates and does not ordinarily permit them. With the possible exception of back-haul cases this is in accordance with the general belief that there is little room for out-of-pocket-cost rates in the motor-carrier industry, since there is an absence of a large mass of constant or overhead costs. There appears no disposition to prescribe high minimum rates for motor carriers in an effort to protect railroads.

Water carriers.—There has been little actual experience in the prescription of minimum reasonable rates for water carriers. The only important instance in which minimum rates have been prescribed for water carriers was a recent case before the United States Maritime Commission involving intercoastal steamship rates.[69] Here the Maritime Commission prescribed minimum reasonable rates in the westbound intercoastal trade. The Commission, upon the basis of the evidence submitted, found that unrestricted competition in rate making by the intercoastal carriers had resulted in rate wars, and in unduly low and depressed rates and charges. The Commission noted that the excessive rate cutting had impaired respondents' capacity to provide service and facilities and to make necessary replacements, and that as a whole the steamship lines were conducting their operations in the westbound intercoastal trade at a substantial operating loss.[70] Minimum rates were therefore prescribed.

Rates to Facilitate Transport Coordination

The most pressing transportation problems of today have grown out of the development of highway transportation, the increased importance of transportation by water and by pipe line, and the intensified competition between all of the various modes of transport. It is generally conceded that each form of transport has its advantages from a cost-and-service standpoint and that there is a place for each in the transportation system of the Nation. The problem of finding the proper place for each mode of transport and fitting it into that place is sometimes referred to as the problem of transport coordination. The attainment of transport coordination does not require the exercise of arbitrary power by an omniscient government which must assign each form of transport to its proper place and keep it there.

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[66] See *Rates over Carpet City Trucking*, 4 M. C. C. 589, 593 (1938); *H. C. Roulston, Inc., Commodity Rates*, 8 M. C. C. 547, 548 (1938); *Alcoholic Liquors from Baltimore, Md., to Washington, D. C.*, 24 M. C. C. 419 (1940).

[67] *Shellac, Liquid—Memphis, Tenn.—St. Louis, Mo.*, 17 M. C. C. 447 (1939); *Plate Glass from Butler, Pa., to Chattanooga, Tenn.*, 18 M. C. C. 747, 751 (1939).

[68] E. g., *Paper Book Matches in Middle Atlantic States*, 17 M. C. C. 601, 604 (1939); *Building Material from Alabama to Southern States*, 22 M. C. C. 171, 175 (1940); *Lubricating Oil and Greases—Oklahoma–Missouri*, 9 M. C. C. 465, 468 (1938).

[69] *Intercoastal Rate Structure*, 2 U. S. M. C. 285 (1940).

[70] *Ibid.*, p. 303.

Technological changes, furthermore, are constantly taking place which change the relative economy and fitness of the different modes of transport for particular services. The place of each form of transport must be found through experimentation, and by allowing a considerable amount of competition between the different transportation agencies.

Theoretical considerations.—Where the traditional form of carrier organization prevails, that is, where separate railroads, water carriers, motor carriers, and pipe lines, compete with each other for traffic, coordination is to a large extent a rate problem. The flow of traffic by the various transportation agencies will be determined in large measure by the rates charged. It has sometimes been suggested that coordination could best be attained by allowing the different modes of transport to compete with each other without Government interference, and that the superior agency in any field of operation would win out. Unfortunately, the problem cannot be solved as simply as this. Coordination cannot be attained by allowing all of the agencies of transport to engage in a free-for-all fight to obtain traffic. If this were attempted, ruthless rate cutting would occur; rates would become unremunerative and below the cost of service for all the carriers; and the ultimate end might be a monopoly of one form of transport, or more likely, some form of agreement between the carriers which would not necessarily result in the allocation of traffic in the most economical manner.

The problem of facilitating transport coordination in the sense in which it is used above appears before Commissions in rate cases involving interagency competition. It is desirable to review the various policies of rate making and of rate regulation that might be adopted in cases which involve competition between different transportation agencies and to consider their results in terms of facilitating transport coordination.

One policy that might be followed is that of protecting the high-cost transportation agency from new and often low-cost agencies which would otherwise tend to cut into the traffic and revenues of the high-cost carrier. It seems evident from the phraseology of the Transportation Act of 1940 that Congress did not intend that the minimum rate power should be used in this way. Provisions in the Motor Carrier Act of 1935 and in the Transportation Act of 1940 require the Commission to recognize the "inherent advantages" of each mode of transport. This provision was apparently designed to prevent the adoption of a rate policy which would protect older forms of transport from competition. If it were not for this precautionary measure in the law, pressure would be exerted upon the Commission to protect existing rail rate structures through the exercise of the power to fix minimum rates of the railroads' competitors. Such a policy would have the effect of depriving the public of the advantages of the cheaper forms of transportation.

Another policy which might be adopted and which has been advocated on occasion, is that the Commission interfere with competitive rate making only to the extent of seeing that no carrier charged less than the out-of-pocket cost of providing the service. By "out-of-pocket" cost is meant the additional cost of carrying the traffic in question over and above the cost which would be incurred if it were not carried. This policy of regulation would be little better than no regulation at all, for to permit competing transportation agencies to reduce rates to an out-of-pocket-cost basis would be to permit competition of the "ruinous" type. The carriers could not survive under such a process of rate making unless there was a substantial amount of non-competitive traffic to support them while engaged in rate cutting elsewhere. To permit a carrier to reduce its rates so long as they covered its out-of-pocket costs would also result in unjust discrimination and undue preference. Points able to obtain out-of-pocket-cost rates would be preferred over those which were required to pay the full cost of transportation, even if the traffic at the latter points were not made to bear excessively high rates. It is difficult to believe that this policy of rate making would meet the approval of the public or of the carriers themselves. Such a policy has long been rejected so far as competition between railroad companies is concerned, and there is no reason to believe that the policy would be acceptable when the competition is between two modes of transport. This policy, therefore, should be rejected as clearly unsound.

There are two policies, however, which might be adopted by the Interstate Commerce Commission in the exercise of its rate-making powers, either of which could be considered as recognizing the inherent advantages of the different modes of transport, but which would be quite different in their results. One of these policies would be to fix the rates on the basis of the cost of service by the low-cost agency, but to permit the high-cost carriers, if they so desire, to meet the rates of the low-cost carrier so long as their own out-of-pocket costs are covered. The other policy would be to require each transportation agency to base its rates on its own costs. Each of these alternatives requires examination.

These policies are alike in two respects. In the first place each gives the public the benefit of the low-cost transportation agency. There is no "holding the umbrella" over the high-cost carrier. In the second place the public would not get rates lower than the full cost of service by the low-cost agency. In other words, the cheaper transport agency could not be allowed to make rates on an out-of-pocket-cost basis.

In ascertaining costs of transportation by the low-cost agency three cautions would have to be observed. High unit costs resulting from a low degree of utilization of facilities should not be permitted to produce rates which restrict more complete utilization. This problem would arise, for instance, if the proposal were adopted of levying tolls for the use of waterways built or improved at Government expense. Furthermore, a certain amount of adjustment in the rates on the basis of the value of the service might be necessary in order to utilize the facilities of the low-cost agency and keep the unit costs at a minimum. In the third place, if cost figures are based on existing operating methods and facilities, they may need to be modified to make allowance for obsolescence, duplicate facilities, and outmoded techniques, before being used for rate-making purposes. If this is not done, some incentive for improvement is removed.

As to the advantages and disadvantages of the two policies, let us consider first that of establishing minimum rates on the basis of the low-cost agency, but permitting the high-cost agency to meet those rates. Four arguments may be advanced in behalf of this policy. In the first place, it represents the least break with the past. The Interstate Commerce Commission has long permitted circuitous rail lines or high-cost routes to meet the rates charged by low-cost routes or direct routes, often granting fourth-section relief to enable them to do so. Likewise the Commission has often permitted rail lines to reduce rates to meet the competition of water lines, pipe lines, and motor trucks, without reducing rates where this competition was not encountered.[71] A second advantage is that it results in a greater degree of competition for traffic, and hence stimulates good service. Third, it may be the only means whereby communities served by the high-cost carrier can maintain a transportation system. If high-cost rail lines were not granted fourth-section relief to enable them to compete with direct rail routes or with water carriers, it might frequently happen that the communities served by the high-cost route or transportation system would be unable to support it and would eventually lose their transportation facilities. This might be a desirable result if the high-cost form of transport were not needed, but in many cases it is needed. In other words, a share of the competitive traffic may be necessary if an essential carrier is to maintain its existence. Closely related to this argument is another. Although ability to share the competitive traffic may not be necessary for the continued existence of an agency it may be a means of lowering rates at points served by it. The contribution of the competitive traffic to fixed and overhead expenses, particularly of a railroad, may enable lower rates to be maintained at the points that it serves exclusively than would be possible if the carrier did not have some competitive traffic. This, of course, is the familiar argument used to justify the granting of fourth-section relief to railroads to meet water competition. The policy of permitting the high-cost form of transportation in such situations to meet the rates of the low-cost form operates as a broad equalizing force, tending to reduce transportation rates at points served only by rail lines, lines, and lessening the disadvantage of location of such towns. Lastly, the policy of permitting the high-cost transportation agency to meet the rates of the low-cost agency may be more economical than to expand the facilities of the low-cost route. This will happen when the existence of unused capacity on the high-cost agency means that additional traffic can be carried with little additional outlay while an expansion of facilities of the low-cost agency would be necessary if it were to carry all the traffic.

Notwithstanding the above arguments there is something to be said for the policy of requiring each form of transport to adhere to rates based on its own costs. In the first place this seems to be the only way to distribute traffic between rival forms of transport in a manner that is not to some degree arbitrary. If high-cost carriers are to be allowed to cut rates to meet the rates of a low-cost carrier, the questions inevitably raised are how low the rates must be cut to attract traffic from the low-cost carrier, and what would be a "fair share" of traffic for each agency of transportation. There seems to be no rational basis for determining the "fair share" of traffic except by placing rates on a cost basis and allowing the traffic to distribute itself as it may. This is the way traffic would be distributed under free competition if competition would work normally in the transport industry.

In the second place, the policy of requiring each form of transportation to charge rates which are based on its own costs avoids wasteful transportation that the other policy may cause. If high-cost transport agencies are allowed to meet the rates of low-cost agencies, it is usually done on the "out-of-pocket-cost" or "added traffic" theory. The argument is that the competitive traffic contributes to the overhead expenses of the high-cost agency, and that it is better for the high-cost route to carry the traffic than not to carry it. This defense of the less-than-cost rates is from the point of view of the high-cost line only. From the point of view of society at large the diversion of traffic from a low-cost agency may result in economic waste. There is certainly economic waste equal to the difference between the direct costs incurred in moving the traffic over the high-cost route and the direct cost that would have

[71] See p. 120, *infra*.

been incurred in handling the traffic over the cheaper route.

The careful observer will note that the above argument is inconsistent with one argument used in behalf of the policy of permitting the high-cost agency to meet the rates of a low-cost agency. We have just stated that to permit the high-cost carrier to divert traffic from the low-cost agency may cause economic waste, whereas it was argued previously that to permit the high-cost agency to meet the rates of the low-cost agency might result in a more efficient use of resources, in that the additional cost of moving the additional traffic by means of the high-cost agency might be less than the cost of moving the traffic via the low-cost agency. This means that sometimes one policy is the more economical and sometimes the other, which suggests that a further analysis of the problem is desirable.

If adequate facilities exist on the part of both forms of transport, the comparison, in order to determine the most economical agency to handle the traffic, is one of the direct costs of transporting the freight by the different agencies. Thus, if the competition is between a rail route and a water route and the direct expenses of hauling the additional traffic by the rail route are less than the direct expenses of moving the traffic via the water lines, the railroad should be allowed to meet the rates of the water lines provided direct expenses of the railroad are covered. If, on the other hand, the direct expenses of the water route are less than those of the rail route, the rail route should not be permitted to meet the rates of the water route. For it to do so would be to divert the traffic to the route which incurs the greater additional expense in moving the freight.

The situation would be different if an expansion of facilities by one route or the other would be necessary in order to carry the traffic in question. If, in the above situation the railroad could take on additional traffic without an expansion of facilities, while the water carriers would have to enlarge their investment in facilities, the comparison should be between the direct or out-of-pocket expenses of the railroad and the full cost (not merely direct cost) of the water carriers.

The above illustration has been purely hypothetical, although actual illustrations of the situations described above can be found. The conclusion seems warranted that each competitive situation should be examined carefully, and that a rate policy appropriate to one set of conditions is not appropriate to a different set. It seems, therefore, that the Interstate Commerce Commission must feel its way in dealing with this problem, but that restrictions should be imposed on less-than-cost rate making to prevent economic waste when that waste is considerable in amount. When only a small amount of waste is involved, that waste may be a low price to pay for the stimulation to good service which the resulting increase in competition brings.

We may summarize as follows the policy suggested in the foregoing discussion. Recognition of the "inherent advantages" of each mode of transport in rate making requires that cost-of-service considerations be emphasized. When two or more agencies of transportation are competing for the same traffic the following policies of rate making should be observed: (1) Rates below the out-of-pocket costs of the low-cost carriers should not be permitted. (2) A bottom should be put under the competitive rates fixed generally by the cost of service of the cheapest mode of transport. (3) Whether high-cost carriers should be permitted to meet the rates of the low-cost agencies, or required to adhere to rates based on their own costs, must depend upon circumstances. In no event should the high-cost carrier be permitted to charge rates which are less than its out-of-pocket costs. The extent to which it may charge rates less than full allocated cost must depend to a large extent upon the degree to which unused capacity may exist on the part of the high-cost carrier, with such further restrictions as may be necessary to prevent excessively wasteful transportation.

In making such suggestions allowance must be made for the fact that costs of transportation by the various modes of transport cannot be accurately determined. Ascertainment of costs is difficult and to some extent arbitrary. The most that can be hoped for is the determination of approximate costs; rigid adherence to cost figures is not warranted.

One further point needs to be made in connection with the proposal that more attention should be placed on cost of service in adjusting rates between competing transportation agencies. The regulatory body, in basing rates on cost, should consider only the costs actually incurred by the various carriers. Insofar as the costs of water transportation are partially defrayed by the taxpayer they do not appear as costs to the operator and would not be reflected in rates. Such costs might be translated into costs to the water carriers by the imposition of tolls for the use of waterways. Part of the costs of highway transportation incurred by State governments are translated into costs to motor carriers through the imposition of special taxes upon motor vehicles and gasoline. Whether a proper share of highway costs is imposed upon the users of the highway is, of course, a much-disputed question. The rate-making bodies, however, can hardly be expected to inflate the costs of water carriers and motor carriers by including in their computations of cost, the expenses which the carriers do not themselves incur. Any economic analysis of the comparative social costs of the various forms of transport should include costs de-

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frayed by the taxpayer as well as those incurred by the carriers, but unless and until such costs are shifted from the taxpayers to the carriers, they cannot very well be included in the determination of costs for the purpose of rate making. The question of whether tolls should be levied for the use of waterways, and the adequacy of motor-carrier contributions to highway costs, are questions of very great importance but they are outside of the scope of this portion of the study.

Past and present policy.—The discussion in the immediately preceding paragraphs has been somewhat abstract in character in an effort to reason out a group of generalized principles that would be economically sound for application to the problem of adjusting rates between competing transportation agencies. Numerous variations of the situation discussed above would arise in actual practice, but it would unduly lengthen this discussion to develop the matter further.

It is appropriate to turn our attention now to the policies of the Interstate Commerce Commission in the adjustment of rates between competing modes of transport in so far as they are revealed by the Commission's decisions. At the outset it should be noted that until recently the Commission had authority only over rail rates, with the exception of limited jurisdiction over certain water-carrier rates. Cases involving the relationship between rail rates and the rates of other carriers were therefore presented to the Commission under somewhat different circumstances than exist today since the Commission now has authority also over motor-carrier and water-carrier rates. In the past, the Commission's control over the rate relationships was largely limited to the determination of how far the railroads might go in meeting competition. The Commission allowed the railroads great freedom in this respect. Since the Commission now has control over the rates of all forms of transportation, air carriers excepted, it is now in a position to control rate relationships more precisely.

Fear has been expressed that the Commission might use its new powers for the purpose of protecting railroads from other forms of transport. The Transportation Act of 1940, however, guards against such action. The declaration of policy written into the Interstate Commerce Act requires that the Act be so administered as to recognize and preserve "the inherent advantages" of all modes of transport. Commissioner Eastman, commenting on a similar phrase in the original Motor Carrier Act of 1935, said: "My understanding has always been that the principal purpose of this language was to make clear that we should not regulate motor carriers for the benefit of any other kind of carriers, but instead be guided by the conditions inherent in motor transportation itself." And he went on to say: "In our administration of the Motor Carrier Act, I know of no instance where we have disregarded this policy of Congress."[72] Of similar purpose was the change made in section 15a of the Interstate Commerce Act by the Transportation Act of 1940. The amendment provides that the Commission, in prescribing just and reasonable rates, shall take into consideration the effect of rates on the movement of traffic "by the carrier or carriers for which the rates are prescribed." Similar phraseology is found in the corresponding rules of rate making provided to govern the fixing of rates of motor carriers and water carriers. These phrases were recently mentioned in *Seatrain Lines, Inc.* v. *Akron, Canton, and Youngstown, Ry. Co.* where the Commission said: "Their meaning, supported also by the legislative history, seems to be that no carrier should be required to maintain rates which would be unreasonable, judged by other standards, for the purpose of protecting the traffic of a competitor."[73]

In view of the declaration of policy now contained in the Interstate Commerce Act, and in view of the new rules of rate making which the 1940 Act provided, it seems improbable that the Commission will use its rate-making powers to maintain rates of one transportation agency at a high level to protect other and higher cost agencies of transport.

We may now turn to a consideration of the Commission's policy in particular types of cases in which the relation between the rates of competing forms of transport has frequently come up for consideration.

Railroad minimum-rate cases.—In many cases in which the Commission is called upon to exercise its power over minimum rates of railroads, or to determine the lawfulness of reductions, proposed by railroads, the force operating to reduce the rail rates below a normal basis is competition with other forms of transportation. We have already discussed the Commission's policy in prescribing minimum rates for railroads. At this point it should be recalled again that the Commission quite generally permits reductions in rail rates below a normal basis to meet the rates of other transportation agencies.[74]

We have noted, however, that there are many limitations on the right of the railroads to reduce rates to meet competition. The following limitations are frequently imposed: (1) That the reduced rates must be "reasonably compensatory", and cover more than the out-of-pocket costs of the service; (2) that undue preference and prejudice must be avoided; and (3) that the

[72] Concurring opinion in *Petroleum between Washington and Oregon Points*, 225 I. C. C. 382, 390 (1937).

[73] 243 I. C. C. 199, 214 (1940).

[74] For illustrative cases see *Petroleum between Washington and Oregon Points*, 225 I. C. C. 382 (1937); *Petroleum from California to Oregon*, 214 I. C. C. 668 (1936); *Lumber from Pacific Coast to Eastern Points*, 210 I. C. C. 317 (1935); *Naval Stores from Mississippi to Gulf Ports*, 235 I. C. C. 723 (1940).

rates must not be lower than necessary to meet competition.

Mention should be made here of a recent case of this type which has resulted in much criticism of the Commission. In *Petroleum between Washington, Oregon, Idaho, & Montana*,[75] the railroads had proposed a rate of 25 cents per hundred pounds on petroleum products from north Pacific Coast ports to Spokane and other interior points. The existing rail rate to Spokane was 41 cents, and the Commission in 1933 had prescribed 45 cents as a maximum reasonable rate for the distance involved. The 25-cent rate had been proposed by the railroads in an effort to meet water competition up the Columbia River to Umatilla, Oreg., and Attalia, Wash., and thence by truck to destination. The Commission held that the 25-cent rate was too low but permitted a rate of 28.5 cents to be put into effect. The Commission felt that the costs of transportation by the river and truck route were not as low as the railroads had figured, and hence that the railroads did not need to reduce their rates to 25 cents in order to obtain a share of the traffic. At first glance the case would appear to be a typical case in which the railroads had proposed a low rate to meet water and truck competition, and were permitted to do so but not to the extent proposed. Considered in this way the case was not inconsistent with hundreds of other decisions of the Commission, and was not inconsistent with the general policy which we have suggested as appropriate in controlling interagency competition. It would appear to be a case in which the high-cost carrier was allowed to meet rates of a low-cost carrier, which, in turn, were based on the costs of transportation by the low-cost agency.

There were other circumstances, however, which put the case in a somewhat different light, and account for the criticism which has been made of the Commission's decision. The proposed rates which the Commission condemned as too low were in no sense out-of-pocket-cost rates. The commission specifically found that the proposed rates were "compensatory, considering all costs"[76] and that the 25-cent rate to Spokane "would yield some margin over full costs."[77] The fact that the Commission would not permit the railroad to charge this 25-cent rate, which more than covered full costs, lends color to the charge that this was "umbrella" rate making, that is, that the Commission was forcing the railroad to maintain rates above its own cost, for the purpose of protecting a high-cost route.[78] Some of the Commission's language, furthermore, might be construed as an attempt to justify "umbrella" rate making, although it was probably not so intended. Thus the Commission remarked that it should not "allow competitive rates to gravitate to the lowest possible level,"[79] and further announced that it would prescribe minimum rates which "will promote a somewhat healthier degree of prosperity for all the carriers concerned, by rail, by highway, and by water."[80]

The proper interpretation of the Commission's decision in this case depends upon reaching a conclusion as to whether the railroad route or the river-truck route was the low-cost route. If the river-truck route was the low-cost route and the railroad was the high-cost route the Commission's decision was in general in conformity with the policy which we have suggested above as appropriate in cases which involve interagency competition. On the other hand, if the railroad was the low-cost agency the Commission indulged in "umbrella" rate making, which is not in conformity with the views set forth above.

Commissioner J. Haden Alldredge noted in a concurring opinion that the cost evidence in the case left much to be desired. For this reason it may be impossible to say conclusively which was the low-cost carrier. It should be borne in mind, however, that the "full costs" which were covered by the 25-cent rate included operating expenses but not taxes, nor return on investment, nor certain other overhead expenses. Thus the rates proposed by the railroads were apparently low, or subnormal, rates. The case, therefore, seems to be one in which the high-cost agency sought to meet the rates of a low-cost agency, and to some extent was permitted to do so. If this analysis is correct the Commission did not indulge in "umbrella" rate making. The Commission's decision in this case was upheld by a three-judge court in *Scandrett* v. *United States*,[81] affirmed by the Supreme Court of the United States.[82] Judge Haney, speaking for the three-judge court, pointed out that although the Commission found that the rate proposed by the carriers was "compensatory, considering all costs", and "would yield some margin over full costs", it did not find that it would yield a "fair return" to the carriers. In fact the implication was quite to the contrary. He implied that if the 25-cent rate, which the Commission disallowed, had yielded a "fair return", by which he probably meant an adequate contribution to return on capital, then the Commission's policy of requiring a still higher rate would have conflicted with the pub-

[75] 234 I. C. C. 609 (1939).
[76] *Ibid.*, p. 632.
[77] *Ibid.*, p. 636.
[78] See *Rates for an Era of Competition*, 110 Railway Age 897, 901 (1941); also dissenting opinion of Judge Fee in *Scandrett* v. *United States*, 32 F. Supp. 995, 1002–1008 (1940).
[79] 234 I. C. C. 609, 637.
[80] *Ibid.*
[81] 32 F. Supp. 995 (1940).
[82] 312 U. S. 661 (1941).

lic's interest. This seems to bear out the conclusion that the 25-cent rate was in fact a depressed rate.

In a more recent petroleum case, *Petroleum, South Atlantic Ports to Southeast*,[83] the Commission, after finding that the railroads were the low-cost agency, stated that their rates on a high-grade commodity like petroleum products, should not average substantially below "full cost" that, is, "operating expenses plus return on investment." In this case the Commission sought to determine the low-cost transportation agency, and to prevent it from charging rates which did not cover full costs, thus definitely establishing the cost of service by the low-cost carrier as a standard.

Fourth-section cases.—Another group of cases in which the relationship between the rates of competing transportation agencies comes into prominence consists of those in which railroads are seeking relief from the prohibitions of the long-and-short-haul clause. By far the greater number of fourth-section cases represent applications by circuitous rail routes for authority to meet the rates of more direct routes without being forced to make similar reductions at intermediate points. Notwithstanding this there are large numbers of cases in which railroads seek relief from the provisions of the long-and-short-haul clause in order to meet the competition of other forms of transport. Cases are numerous in which fourth-section relief is granted to enable railroads to meet water competition. Fourth-section relief is also granted very frequently to enable railroads to meet motor-truck competition.[84] Pipe-line competition also has frequently led to the granting of fourth-section relief.[85] Numerous cases also arise in which fourth-section relief is granted to enable railroads to meet competition of routes combining two or more of the above forms of transport.

Detailed analysis of fourth-section cases is unnecessary, but it should be recognized that in the great majority of fourth-section cases coming before it the Commission permits the railroads to reduce through rates to meet competition of water lines, motor carriers, and pipe lines, without reduction at intermediate points where similar competition does not exist. Certain limitations and restrictions are commonly imposed in these cases. The reduced through rates must be "reasonably compensatory" for the railroad; the competition must be encountered at the through points and not at the intermediate points; and the reduced through rates must be no lower than necessary to meet competition.

[83] 245 I. C. C. 23 (1941).

[84] For some recent examples see *Sand and Gravel in Southern Territory*, 234 I. C. C. 433 (1939); *Cheese from Points in Wisconsin*, 234 I. C. C. 749 (1939); *Sugar from Camden, N. J., to Fulton, N. Y.*, 231 I. C. C. 211 (1938).

[85] *Gasoline from Superior, Wis.*, 222 I. C. C. 487 (1937); *Petroleum and Petroleum Products*, 183 I. C. C. 24 (1932).

The policy in fourth-section cases was worked out before the Interstate Commerce Commission had jurisdiction over motor-carrier rates and when it had only limited jurisdiction over rates of water carriers, but there is no reason to believe that the policy will be fundamentally different now that the Commission has authority over motor-carrier and water-carrier rates. The Commission does, however, have the rate relationships somewhat more under its control than formerly and could put a bottom under the rates of the low-cost carrier before granting fourth-section relief to the railroads to meet the competitive rates. The Interstate Commerce Commission has long granted relief to circuitous rail routes to meet the competition of a direct rail route. In these cases, however, the rates of the direct rail route are nearly always normal rates, often based on distance scales prescribed by the Commission. Thus the standard is the normal rate via the direct route, but the high-cost or circuitous route is permitted to meet this rate if reasonably compensatory to it. Since the Commission has had control over the rates of the direct rail routes, it has been able to follow this policy.

A similar policy could not, in the past, be applied in fourth-section cases involving competition of railroads with motor carriers and water carriers since the Commission did not have any way of insisting that the rates of the motor carriers or water carriers were on a reasonable basis. The situation can be illustrated by cases in which "flexible relief" has been granted railroads to meet competition of water lines. This was done for instance in *Pacific Coast Fourth Section Applications*,[86] *Citrus Fruit from Florida to North Atlantic Ports*,[87] *and Sugar from California to Chicago*.[88] Relief granted in these cases was "flexible" in that if the water carriers should reduce their rates, further reductions could be made by the railroads without action by the Commission. Inability of the Commission to control the water rates made the granting of flexible relief almost necessary, if the railroads were to be permitted to compete for the traffic in face of efforts of the water carriers to recover it. The Commission could not insist that the water-carrier rates be on a reasonable basis. Such rates may have been depressed in some instances by the efforts of the water carriers to keep their rates sufficiently below rail rates to obtain a share of the traffic. With jurisdiction over water-carrier rates the Commission could now insist upon adequate rates via the cheaper transportation agency before granting fourth-section relief to railroads.

The past policy of the Commission in fourth-section cases, where relief has been sought to meet competition

[86] 165 I. C. C. 373, 404 (1930).

[87] 211 I. C. C. 535 (1935).

[88] 211 I. C. C. 239 (1935).

of cheaper modes of transport, has generally been consistent with the policies which we have suggested above as appropriate in cases involving the adjustment of rates between competitive transport agencies, with the exception that the Commission, in the past, has not been able to insist that the rates of competing carriers by water or by motor vehicle were themselves adequate; and, in granting relief to enable the railroad to meet competition of the other forms of transport there may not have always been an adequate analysis of the conditions of unused capacity which alone can justify substantial reductions from the normal rail rates at competitive points.

Joint rail-water rates.—The Interstate Commerce Commission has long had jurisdiction over joint rail-water rates. The relationship between such rates and all-rail rates has therefore been before the Commission on numerous occasions. In *Lake and Rail Class and Commodity Rates*,[89] the Commission established lake-rail class rates at differentials under the all-rail rates.[90] In some other cases the Commission has refused to make rail-water rates fixed differentials under the all-rail rates.[91] When rail-water rates have been prescribed differentially lower than all-rail rates the lower costs of service by the water routes have been mentioned in justification of the lower rates. The differentials, however, have not always been made to correspond to differences in costs of service. In cases concerning the relation between joint rail-barge rates on the Mississippi River and its tributaries and all-rail rates the policy has been followed of making the rail-barge rates fixed differentials under the all-rail rates.[92] In these cases the barge-rail rates were made 20 percent less than the all-rail rates, although deviations from this differential are permitted. The Inland Waterways Corporation Act has required the Commission, in certain types of proceedings, to establish "minimum differentials" between rail-barge and all-rail rates. This seems to contemplate the maintenance of rail-barge rates at differentials under the all-rail rates, and might result in rates higher or lower than strictly cost-of-service considerations would warrant.

The policy of adjusting rates between competing transportation agencies which has been suggested in earlier paragraphs would require that the barge-rail rates, as well as the port-to-port rates of the water carriers, be related to the costs of operation. After this had been done the extent to which all-rail routes might meet these rates would have to be determined. It should be pointed out in this connection that until the enactment of the Transportation Act of 1940 the Interstate Commerce Commission could only prescribe maximum joint rail-water rates, and that therefore the relationship between rail-water rates and all-rail rates was not completely under its control. The Inland Waterways Corporation Act empowered the Commission to fix "minimum differentials" between rail-barge and all-rail rates, but this is not the power to determine minimum rail-barge rates themselves. The section of the Inland Waterways Corporation Act referred to has been repealed by the Transportation Act of 1940.

Motor-carrier rate cases.—Motor-carrier rates have been discussed previously. Attention should be called again to two features of the Commission's policy in dealing with motor-carrier rates. The first of these is that the Commission has permitted the motor carriers to use classifications based on the rail classifications. In other words, value-of-service considerations have been allowed to dominate the freight classifications of motor carriers as they have rail classifications. In defending this policy against the contention that motor-freight classifications and rates should be governed primarily by cost-of-service considerations the Commission has said: "It requires no great penetration, however, to perceive that such a method of making motor-carrier rates cannot produce satisfactory results so far as earnings are concerned, unless the rates of competitors are constructed in a similar manner * * * It may be that it will ultimately be found that both railroad and motor-carrier rates should conform to cost-of-service principles, but it is clear that as matters now stand motor-carrier rates cannot reasonably be constructed without regard to the competitive rates of other carriers."[93] In *New England Motor Carrier Rates*, the Commission spoke approvingly of the theory on which the New England motor freight classifications were constructed, but considered the use of these classifications somewhat impractical under existing conditions. The Commission said: "It is evident that if the railroads are permitted to meet competitively the rates of the motor carriers where the latter have the advantage in costs of service, and at the same time the motor carriers refrain from meeting the rail rates where the railroads have the cost advantage, the net result will be disadvantage to the motor carriers."[94] The second point

[89] 205 I. C. C. 101 (1935).

[90] See p. 97, *supra*.

[91] E. g., Consolidated Southwestern Cases, 211 I. C. C. 601, 627-628 (1935); 222 I. C. C. 229 (1937).

[92] *U. S. War Department* v. *Abilene & Southern Ry. Co.*, 92 I. C. C. 528 (1924); *Inland Waterways Corp.* v. *Chicago Great Western R. R. Co.*, 129 I. C. C. 521 (1927); *Inland Waterways Corp.* v. *Alabama Great Southern R. R. Co.*, 151 I. C. C. 126, 144 (1929); *Application of American Barge Line*, 190 I. C. C. 177 (1932); *Through Routes and Rates between Inland Waterways Corp. and Other Common Carriers*, 192 I. C. C. 173 (1933).

[93] *Central Territory Motor Carrier Rates*, 8 M. C. C. 233, 249-250 (1938).

[94] 8 M. C. C. 287, 322 (1938).

concerning the Commission's policy in the motor-carrier cases which should be recalled here is that although the Commission has not generally approved out-of-pocket-cost rate making for motor carriers, it has made an exception when the motor carrier is competing with railroads which maintain out-of-pocket rates on the traffic in question.[95]

It must be concluded that in the adjustment of rates between motor carriers and railroads little progress has been made toward the adjustment of rates according to costs of service. As yet there has been little effort to work out an adjustment of rates that recognizes the cost advantage of motor carriers where they have an advantage over the railroads and that recognizes the cost advantage of railroads where they have the advantage over the motor carriers. Undoubtedly there is a wide range of operations in which the cost advantage of one or the other is so uncertain or so small in amount that equalization of rates is warranted; but a greater recognition of cost advantages would seem to be required if the "inherent advantages" of each mode of transport are to be recognized in rate making. Certainly the encroachment of motor carriers on railroad traffic by out-of-pocket-cost rates, and the encroachment of railroads on motor-carrier traffic by out-of-pocket-cost rates, requires restriction to the situations in which it can be clearly justified.

Failure to bring about a readjustment in rates which tends to give greater weight to costs of service by the different modes of transport can doubtless be explained by a number of considerations. These include the newness of motor-carrier regulation and the suddenness with which the Commission has been called upon to provide some temporary basis for motor-carrier rates; the fact that in most motor-carrier rate cases the corresponding railroad rates are not in issue; the precedent of long-established practice in the construction of railroad rates, and the inadequacy of cost data.

Regional Rate Levels and Interterritorial Rates

Railroad rates in the United States have developed somewhat on a regional basis. It has been impossible, because of the existence of a large number of competitive routes and a network of interlacing railroads, to make rates on each railroad independent of the rates charged by other railroads serving the same general area. In the prescription of railroad rates, the Interstate Commerce Commission has been inclined to determine the level of class rates and commodity rates on particular articles and to prescribe distance scales of rates after a consideration of the costs of transportation generally throughout the area covered by the particular rate structure under investigation. To be sure, there has sometimes been a tendency to recognize differences in transportation costs in different zones or portions of a large area and to prescribe higher or lower rates on traffic in such areas as seem to be justified by the differences in transportation costs. Furthermore, the Commission has sometimes permitted short and weak lines to charge higher rates than are prescribed for a region generally, in recognition of the particular cost conditions existing on these roads. Notwithstanding this recognition of differences in cost, rates are often prescribed for large areas, and costs of transportation, insofar as they are made the basis of rates, are the costs applying generally in the area. This has resulted in higher rate levels in some areas than in others. The class-rate level, for instance, is much lower in Eastern Territory than in Southern Territory, and lower in Southern Territory than in the western part of the United States.[96]

This situation has raised the very serious question of whether these differences in rate levels are justified and whether differences in industrial development in various parts of the United States may not be caused by these differences in rate levels. These differences create a problem in fixing of rates from points in one area to points in another area having a higher or lower rate level. Important rate controversies have centered around this problem. The Transportation Act of 1940 directs the Interstate Commerce Commission to investigate interterritorial rates and differences in rates in different regions. For this reason no attempt is made here to set forth detailed facts regarding differences in rate levels and the construction of interterritorial rates. It is not inappropriate, however, to indicate some of the questions of principle and policy which are involved in this controversy.

The first issue presented is whether differences in costs of transportation in the different regions justify the differences in rates found to exist. This question is to be answered by a comparison of the costs of operating railroads, or other carriers, in each region.[97] If no differences in cost are found, then no differences in the rate levels are justified, although there may still be the question of whether the burden of supporting the transportation system should be distributed among various

[95] See p. 112, *supra*.

[96] See *The Interterritorial Freight Rate Problem of the United States*, 75th Cong., 1st sess., H. Doc. No. 264 (1937).

[97] No attempt is made here to reach any conclusions as to the differences in rail transportation costs in different regions. The Bureau of Statistics of the Interstate Commerce Commission, however, has made studies of this sort. The most recent one is entitled "Cost of Performing Railroad Freight Service in the Various Rate Territories," and has been introduced as evidence in Docket Nos. 28300 and 28310, investigations of the class-rate structure and the consolidated freight classification.

commodities in the same manner in the different areas or regions. The latter question will be considered shortly. If substantial differences in transportation costs are found in the different territories, a further question of public policy is raised. Should the differences in transportation costs be ignored in the interest of a uniform development of all parts of the country, or should differences in rates which reflect differences in transportation costs be considered as sound and proper? This question is not wholly an economic question since sociological questions, national defense considerations, and the like may enter into a choice of policy. The policy of ignoring the differences in transportation costs means higher rates in the areas having low-cost transportation than would otherwise prevail and lower rates in areas having high-cost transportation. The system is in effect a subsidization of areas having high-cost transportation. It follows that this system of rate making will encourage uneconomical division of labor between areas, and uneconomical transportation, in the regions that have rates lower than the costs of providing the service. Conversely, in the areas which pay higher rates than they otherwise would, an economical division of labor and exchange of commodities between areas is prevented. From a purely economic point of view the basing of rate levels on cost of service would seem to be preferable and would result in the most economical use of resources. It must be admitted, however, that in the past there has been much disregard of differences in transportation costs in fixing rates, and that the equalization of rates in different areas or regions would be but a step further in a direction that has already been taken. Differences in transportation cost between regions may be no greater, and perhaps not so great as differences in costs by various railroads in a given territory. Differences in costs of transportation by different railroads in the same territory are very generally ignored in rate making. Competition perforce requires it. But just as the necessity of disregarding differences in cost between different railroads has created the "weak-and-strong-road" problem, i. e., the problem of supporting the weaker lines, so a policy of ignoring differences in cost of transportation in different regions would raise the problem of supporting the railroad system in the areas having high transportation costs. Our conclusion on this point is that it is probably preferable to have regional differences in transportation cost reflected in rates. If Congress should choose to equalize rates, regardless of differences in cost of transportation in different areas, the effects would not be particularly serious provided some means were found, through divisions of joint rates, pooling, or other devices, to support the railroads in the areas having high transportation costs.

There remains the further question of whether the transportation burden should be distributed in the same way in different parts of the country. Thus it is often pointed out that while the class rates in the South have been higher than in the North, there have been many more very favorable commodity rates in the South, particularly on various raw materials. Presumably the differences in the distribution of the transportation burden in the different areas are based upon differences, real or alleged, in the ability of the traffic to stand certain rates. But this ability or inability of the traffic to support the transportation system, may, in turn, be the result of the existing industrial development, or lack of it, which might itself be changed if the distribution of the transportation burden were changed. Thus, it is argued by those who oppose a lowering of the class-rate structure in the South that high class rates are necessary since the need of low commodity rates on raw materials in the South makes it necessary to collect higher charges from the class traffic. Those who advocate lower class rates in the South maintain that if class rates were lowered in the South, and from the South to the North, the volume of class-rate traffic would increase since industrialization of the South would be made possible. Assuming for the sake of the argument that higher class rates in the South have been a factor in retarding the industrial development of the area, it may be said with equal plausibility that low commodity rates on raw materials produced in the South which favor the shipment of these products from the region, may have been equally a cause of the lack of industrial development of the South. Higher rates on these raw materials might exert a pulling force to attract certain manufacturing industries to the South in closer proximity to the raw materials.

If differences in distribution of the transportation burden affect the location of industries and the industrial development of the areas concerned, an equal distribution of the burden in all areas would promote a more even development of the country. This suggests that the same general distribution of the transportation burden might well be maintained throughout the country. This equality need not extend to commodities on which different rates in different areas will not affect locational patterns. Locational patterns in many instances are determined by natural resources, and are not affected by differences in transportation rates. But where location of industries or general industrial development may be affected by differences in rates, approximate equality in rates, so far as cost of service will permit, would seem to be socially desirable.

The following conclusions seem justified: from a strictly economic point of view differences in costs of transportation in different regions should be reflected

in different rate levels and in the rates on all commodities. In other words, approximately the same distribution of the traffic burden among different kinds of traffic would be in the interest of promoting the most even development of each region consistent with differences in transportation costs.

If these conclusions are warranted, the problem of constructing interterritorial rates is not a difficult one. Rates made between one territory and another which has a different rate level should ordinarily reflect the different rate levels in proportion to the length of the haul in each territory. This means that rates between the same points in both directions would tend to be the same, both reflecting the higher rate level in one territory to the extent that a portion of the haul is in that territory. Then any attempt to place rates on "the destination basis", as he sometimes been urged, turns out to be a clear case of favoring the industries in the higher rate territory. There remains the question, however, of whether the railroads may be permitted to reduce the rates from one territory to another below the general basis in order to equalize rates from different sources of supply. The force of "market competition" would cause the railroads, in many cases, to do this. Under present regulatory laws the railroads have considerable freedom in this respect although they cannot ordinarily be compelled to equalize rates in this manner. If the policy of permitting the railroads to engage in such voluntary reductions in rates is to be continued, it should be recognized for what it is, namely an attempt to equalize opportunities in disregard of natural advantages and disadvantages of the various producing points. When this policy of neutralizing advantages and disadvantages of location is practiced by a railroad in adjusting rates from different producing points on its own lines the result is frequently undue preference and prejudice prohibited by section 3 of the Interstate Commerce Act. When equalization is accomplished by a railroad in competition with another railroad serving another point of production, the resulting adjustment is not unlawful under present legislation.

In concluding this discussion of some questions of principle involved in the interterritorial rate problem it should be recognized that the Interstate Commerce Commission is not at liberty to base its decisions on broad questions of public policy, such as the social or economic desirability, or undesirability, of facilitating the industrialization of the South. Such matters, however, are within the province of Congress to consider, and it may prescribe standards of rate making or policies of control to attain the desired end, so long as its action is not inconsistent with constitutional rights of parties affected.[98]

[98] See pp. 125 126, *infra*.

Postalization of Rates and Fares

Proposals have been made from time to time to "postalize" rates and fares of railroads. By "postalization" is mean the establishment of flat rates or fares which, within broad limits, would apply irrespective of the length of the haul or journey. This idea has never been taken seriously by those closely associated with the transportation industry. The proposal has, however, made considerable popular appeal.

As far as it relates to passenger fares, the proposal would establish a zone system of fares, reduce fares drastically, and ignore differences in distance within broad limits. Increased travel would doubtless be encouraged, but most of the increase would be on the longer trips. An increase in car-miles and perhaps in train-miles would be required, vitiating the assumption that a large increase in business could be handled without an increase in expense. These objections would apply more strongly to postalization of freight rates which is frankly advanced as a proposal to "annihilate distance". Long-haul business would be stimulated, operating costs increased, uneconomical transportation created, and property values destroyed on a broad scale to be replaced by increased values elsewhere. The total transport burden would be increased because of the substitution of long hauls for shorter ones.

Freight Rates as an Instrument of National Policy

Freight rates may be used as an instrument to carry out some aim of the state or some social or economic policy that has official approval. Freight rates, for example, may be fixed for the purpose of encouraging exports, discouraging imports, or causing some exported product to be exported in manufactured or semimanufactured form rather than as a raw material. Rates may be used to discourage the consumption of articles deemed harmful, or to encourage the use of articles deemed beneficial. Rates may be manipulated to facilitate centralization or decentralization of industry or to further the industrialization of particular areas.

The use of freight rates or, in fact, the whole transportation system, as an instrument of national or social policy is particularly common and relatively simple where government ownership of railroads prevails. When railroads and other parts of the transportation system are privately owned and operated, the ability of government to adjust freight rates to accomplish some definite social or economic purpose is definitely limited.

Up to the present time there has been little attempt to use the power to regulate rates for the purpose of broad social or economic objectives other than the creation and maintenance of an "adequate transportation system" and the prevention of unreasonable or unjustly discriminatory rates.

The standards of reasonableness set up by the Interstate Commerce Act are transportation standards, i. e., they relate to costs of service and matters influencing the demand for transportation services. Other matters are largely beyond the province of the Commission. In the words of the Supreme Court of the United States the standards set up by the Interstate Commerce Act are "transportation standards, not criteria of general welfare".[99] The Commission has generally refused to make decisions, with respect to the reasonableness or unreasonableness of rates, depend on considerations of general welfare or public policy, as, for instance, when it refused to require lower rates on flour for export than on wheat, when the relationship in rates was urged on the grounds that flour rather than wheat should be exported in order to develop the milling industry in the United States.[1] Particularly in cases which affect the location of industries, or the ability or inability of certain producers to sell in a given market, the Commission is insistent that transportation standards should govern, and that the Commission may not act in the role of an economic arbiter deciding where production shall be carried on or in what markets a producer shall sell. Thus, in one case the Commission said: "We have neither the inclination, the wisdom, nor the power to make or regulate rates for the purpose of determining whether goods shall be bought or sold, produced, manufactured, or consumed in one section or locality, or by one set of persons or another. Such has been the settled policy of the Commission from its creation in 1887 to the present day. We have other well-recognized standards by which the lawfulness of rates have been and are tested, and these standards concern themselves with transportation characteristics. When the standards are applied, the necessary and immediate effect may be to interject into an existing commercial situation new factors, important to those who produce or distribute, buy, or sell, and to their competitors: but such result is neither the cause nor end which has motivated our action."[2] For the Commission to hold otherwise would make it a sort of economic dictator over the commercial and industrial life of the Nation.

It cannot be said, however, that the Commission has always turned a deaf ear to economic and social considerations in disposing of rate cases. As Professor Sharfman has put it: "The Commission's interest in protecting small shippers has sometimes gone further than the insurance of objectively fair charges, the social importance of goods has sometimes been advanced as reason for especially low rates; the development of remote areas has been deemed a significant consideration in some cases; the promotion of competition has been regarded as a desirable goal; commercial equality seems to have supplemented more clearly acceptable considerations in justification of rate groups."[3] Professor Sharfman concludes, however, that the departure from strictly transportation standards is the exception rather than the rule.[4] Nontransportation standards have affected the Commission's decisions in small degree. Rarely have they been controlling, and often they are ruled out as entirely irrelevant. Frequently, when such factors are mentioned they merely provide justification for refusing to disturb some established rate relationship or rate policy which has been attacked.

The enactment of the Hoch-Smith Resolution by Congress in 1925 might be construed as an effort to inject certain nontransportation standards into the Commission's policy. The resolution declared that the "true policy" of rate making to be observed by the Interstate Commerce Commission was to consider the "conditions which at any given time prevail in our several industries * * * insofar as it is legally possible to do so, to the end that commodities may freely move". In making rate adjustments under the resolution the Commission was further directed to consider "a natural and proper development of the country as a whole". The Commission was also directed, in view of the agricultural depression, to prescribe the "lowest possible lawful rates" on the products of agriculture. The "conditions which at any time prevail in our several industries", mentioned in the "true policy" of rate making, referred to conditions of prosperity or depression. The resolution seemed to call for preferred treatment of agricultural products and the products of any other depressed industries; and also to require the Commission to inject a certain amount of industrial planning into its consideration of rate controversies. The Supreme Court, however, interpreted the Hoch-Smith Resolution in such manner that it was rendered largely ineffective. In *Ann Arbor R. R. Co.* v. *United States* the Supreme Court of the United States, referring to the "true policy" of rate making laid down in the Resolution, said: "The paragraph does not purport to make any change in the existing law, but, on the contrary, requires that that law be given effect. Nor does it purport to make unlawful any rate which under the existing law is a lawful rate, but on the contrary leaves the validity of the rate to be tested by that law."[5] And in a later case the Court, referring to the Hoch-Smith Resolution, said: "The

[99] *Texas & Pacific Ry. Co.* v. *United States*, 289 U. S. 627, 638 (1933).

[1] *Bulte Milling Co.* v. *Chicago & Alton R. R. Co.*, 15 I. C. C. 351 (1909).

[2] *Lake Cargo Coal*, 139 I. C. C. 367, 391 (1928). See also *Sugar Cases of 1922*, 81 I. C. C. 448, 472 (1923).

[3] Sharfman, I. L., *The Interstate Commerce Commission, Part III B*, p. 763. For further elaboration of these points see *Ibid.*, pp. 518–521, 670–681. See also Commissioner Prouty's dissent in *Planter's Compress Co.* v. *C., C., C. & St. L. Ry. Co.*, 11 I. C. R. 382, 410 (1905).

[4] *Ibid.*, p. 763.

[5] 281 U. S. 658, 669 (1930).

legal standards governing the action of the Commission in determining the reasonableness of rates are unaltered."[6] It may be said, therefore, that the sponsors of the Hoch-Smith Resolution were unsuccessful in their attempt to inject nontransportation criteria into the determination of the reasonableness of rates.

There are two ways in which Congress can interfere in the rate-making process to accomplish desired social or economic objectives. One is through direct legislative rate making. The other is through the prescription of nontransportation standards in the Interstate Commerce Act or through specific instructions to the Interstate Commerce Commission to observe desired policies of rate making. Although direct legislative rate making is generally considered to be unwise there can be no denial of the power of Congress to prescribe rates if it chooses, subject, of course, to constitutional limitations. The other approach, that is, the laying down of legislative standards and policies of rate making to be observed by the Interstate Commerce Commission, is more in accordance with traditional methods of regulation. Of course the legislative standards and policies would have to be devoid of such qualifying adjectives and phrases as characterized the Hoch-Smith Resolution or they would meet a similar fate.

Constitutional difficulties would undoubtedly be encountered in either of the above approaches. Disregard of cost and demand factors would often conflict with efforts of railroads to operate their lines at a profit and would conflict with property rights. A lower Federal court once held that under the Hoch-Smith Resolution the Commission did not have the right "to regulate industrial conditions under the guise of regulating rates," and in so holding, the court said: "We do not think that Congress *could* give such power to the Commission."[7] [Italics ours.] One reason, furthermore, why the Supreme Court gave the Hoch-Smith Resolution such a restricted meaning was to avoid doubts as to its constitutionality.[8]

It must be concluded that constitutional difficulties would limit the extent to which transportation rates can be manipulated for the purpose of effecting social and economic objectives as long as the railroads and other transportation agencies are privately owned and operated. To make freight rates a really effective tool of social policy, government ownership of railroads would be necessary. Under private ownership of railroads, and within the framework of the Federal Constitution, there can be only a limited adjustment of rates to effect desired social policies. Aside from the constitutional aspects of the problem, the wisdom of allowing broad social and economic objectives to displace ordinary price-making considerations in fixing rates is open to question. No generalization is possible. The wide range of objectives that might be sought, their varying importance compared with the unfavorable economic effects that might result from interfering with ordinary pricing considerations, and the varying degrees to which the nontransportation objectives would affect rate making preclude any general weighing of benefits and disadvantages. Each proposal to inject nontransportation factors into rate making must be judged separately. Its purely economic consequences should be carefully considered, and balanced against the advantages of the ends sought. It might also be noted that many of the proposals for substituting broad social and economic objectives for ordinary supply and demand considerations in rate making involve an element of subsidy to particular classes, industries, or areas, and are open to the objections that may always be directed against subsidy. Proposals of this sort may also adversely affect railroad revenues and impair the ability of the transportation system to support itself.

[6] *Atchison, Topeka & Santa Fe Ry. Co.* v. *United States*, 284 U. S. 248, 262 (1932).

[7] *Anchor Coal Co.* v. *United States*, 25 F. (2d) 462, 472 (1928).

[8] See *Ann Arbor R. R. Co.* v. *United States*, 281 U. S. 658, 669 (1930).

CONCLUSIONS

1. Under conditions which have prevailed since 1920 it has been virtually impossible for the railroads to maintain rates which would yield a fair return on the "fair value" of their properties as a whole. Depressed conditions, and the rise of competing forms of transport, have been the principal causes of this situation. By changes made in section 15a of the Interstate Commerce Act, Congress has recognized this state of affairs. The constitutional right of a railroad to rates which will enable to it earn a fair return on the "fair value" of its property still remains, and section 15a of the Interstate Commerce Act still requires the Commission to consider the revenue needs of the railroads in fixing rates. Neither the constitutional right nor the statutory mandate imposed on the Commission can bring carrier prosperity when economic conditions and the existence of alternative transportation agencies make the imposition of high rates impossible. Railroad management should not place its hopes for more adequate income upon a constitutional or statutory rule of rate making which implies that the problem of inadequate railroad earnings can be remedied by manipulation of the rate level

without much regard for the conditions of demand for transportation service.

2. The effect of rates upon the movement of traffic has been an important factor in rate making under the conditions which have prevailed in recent years. This has raised the question of the extent to which the Interstate Commerce Commission may properly substitute its judgment for that of railroad management concerning the revenue effect of proposed rates. Section 15a, as now written, requires the Commission to consider "the effect of rates on the movement of traffic." As long as the Commission has any responsibility for the adequacy of railroad revenues it cannot close its eyes to the probable effects of proposed increases or reductions in rates. Railroad management, however, should be in a better position than a government agency to determine the effect of rates on the movement of traffic. If rates proposed by the carriers are well considered and made in good faith, and if they can be defended if challenged, it is not likely that the Commission will have many occasions to substitute its judgment for that of management on the probable results of the changes proposed.

3. The development of motor-vehicle transportation has tended to break down the traditional system of railroad rates insofar as it was characterized by higher rates on valuable articles than could be justified by cost-of-service considerations. Revision of railroad classifications, the adoption of all-freight rates, and other devices to lower the rates on the high-grade traffic should enable the railroads to recover some of the traffic lost to highway carriers. The old system of rates, with high rates on valuable articles, can be maintained if motor carriers are required or permitted to make rates which are patterned after the traditional railroad rates, but only if restrictions not in the public interest are imposed on contract carriers and on private transportation. The lowering of high rates on high-grade traffic is preferable to the restoration of monopolistic conditions in the field of transport.

4. Efforts of railroads to meet new competitive conditions by multiple-car rates and graduated quantity rates should be encouraged if properly controlled to prevent unjust discrimination and other abuses.

5. The power to prescribe minimum rates of the various transportation agencies should be exercised with caution. The power has been exercised for the purpose of preventing carrier competition from becoming "ruinous" in character, i. e., from resulting in rates that are generally below the real costs of providing the service. The minimum-rate power should not be exercised in such manner as to protect inefficiency, or to "hold the umbrella" over high-cost carriers.

6. Since the Interstate Commerce Commission now has control over rates of railroads, pipe lines, motor carriers, and water carriers, it will be confronted more and more with cases which involve the relation between the rates of competing forms of transport. Recognition of the inherent advantages of each mode of transport would seem to require emphasis on cost of service in fixing rates of competing transportation agencies. In particular, competition between different modes of transport should not be permitted to become "ruinous" in character, with rates lower than are warranted by costs of transportation by the cheaper form of transport. On the other hand, there should be no effort to maintain high rates for the purpose of protecting high-cost forms of transport where they encounter competition with low-cost forms. Generally speaking, rates should be based on the cost of service by the most economical agency. The extent to which other forms of transport might be permitted, within limits, to meet these rates if they so desire, depends in large measure upon conditions of unused capacity on the part of the high-cost agency, and the comparative costs of handling additional traffic by the different transport agencies. Each case of this sort must be considered on its merits, since a policy appropriate to one set of circumstances would not be appropriate to another. Many decisions of the Interstate Commerce Commission in cases which involve the relation between the rates of different but competing modes of transport seem to approximate the general policy suggested above. The relations between motor-carrier rates and railroad rates, however, have not generally been brought into conformity with such a policy.

7. Rate structures in the United States have developed on a regional basis. As a result, freight rates, particularly class rates, are higher in some parts of the United States than others. This situation, together with methods sometimes used in the construction of rates from one territory to another, may have been a factor in the unequal economic development of different areas. Differences in rates in different parts of the United States should not exceed differences in the costs of providing transportation service. Whether rates should be equalized throughout the United States regardles of differences in transportation costs is an important question of public policy. From a strictly economic standpoint it is preferable to have these differences in transportation cost reflected in the rate structure. Social, military, or other considerations, however, might lead to the adoption of a policy of uniformity in rate levels. If Congress should decide on such a policy, it would be necessary, if differences in transportation costs are considerable, to find some means, through the division of joint rates, pooling, or other devices, to support the railroads in the areas having higher transportation costs. If differences in rate levels are to per-

sist, interterritorial rates should normally reflect the rate levels in each territory in proportion to the length of the haul in each.

8. Postalization of railroad passenger fares, which has been proposed from time to time, does not seem to offer any promise of increased profits from the passenger business. Postalization of freight rates would have very serious consequences. It would undoubtedly result in an enormous amount of wasteful transportation at very low rates, would impose huge financial losses upon the railroads, and would destroy property values on a large scale without any net social gain.

9. Under private ownership and operation of railroads, and under the limitations imposed by the Federal Constitution, the extent to which freight rates can be used as a tool to effect desired social or economic ends is strictly limited. Aside from the constitutional aspects of the problem, any attempt to inject nontransportation considerations in the prescription of transportation rates should receive most careful study before adoption. Proposals of this sort may adversely affect carrier revenues and, hence, the ability of the transportation system to support itself. Frequently, they also contain an element of subsidy to particular places, areas, industries, or classes of persons, and are open to objection for this reason.

PART I—SECTION III

2. THE NATURE OF AN ECONOMICAL DIVISION OF TRAFFIC[1]

By Thor Hultgren[2]

The Concern Over Economy

It is believed in many quarters that the freight and passenger traffic of the United States is not economically distributed among the various means of transport—rail, highway, pipe line, water, and air. In many instances, it is thought, traffic which could better travel by one means, is being handled by another. The views expressed by the committee of six labor and railway officials to consider the transport situation are illustrative.[3] As an ideal they commended "an orderly and proper development of a national transportation system, in which each of the various agencies will be utilized in the way and to the extent that is justified by sound economic consideration." They thought such a state of affairs unlikely to be realized until all of the agencies "are accorded equality of treatment" "in all matters of governmental regulation, imposition or subsidization." They recommended that all methods of transportation be so regulated "as to preserve the inherent advantages of each." The belief that traffic was or is in danger of being uneconomically divided has been recognized by Congress in the Transportation Act of 1940, which provides that a board shall be appointed with the duty of investigating "the relative economy and fitness of carriers by railroad, motor carriers, and water carriers for transportation service, or any particular classes or descriptions thereof."

Elements of "Fitness"

In most discussions of fitness it is implied that there is an ascertainable cost of handling a "particular description" of traffic via any specifiable means of transport, and that the various means can therefore be compared with respect to the cost of handling that traffic. The agency which has the lowest cost could be called the "fittest" or most economical. But to identify fitness or economy with cost only is to take a narrow view. Traffic can often be handled more safely, quickly, and conveniently by one means of transport than another. The service is better. The difference in service is sometimes important to the shipper or traveler. In such cases it would hardly be called economical for the traffic to go by the low-cost means, if that is the inferior means. Handling of traffic via a low-cost means sometimes creates serious inconvenience to other traffic using the same means. Under some conditions truck traffic interferes with the flow of passenger automobile traffic. Where the interference is serious, a railroad might be considered the "fittest" means of handling part of the traffic, even if the cost by truck were lower. "Fitness," considered as economy, is a matter not only of cost but of service and convenience. Other considerations might be regarded as determining fitness. Diversion of traffic from one means of transport to another disturbs vested interests. Anyone solicitous for these interests might consider the means around which these interests cluster as fittest. The business of trucking is carried on by smaller concerns than the business of railroad transport. Anyone who believes fervently in the encouragement of small enterprises might therefore regard highway transport as the fittest for much traffic. Considerations like these, however, seem to stretch the concept of economy. For the purpose of this paper, the low-cost means will be regarded as the economical means, except where some other means has an important advantage in the way of service or convenience, in which case the latter means will be regarded as more economical.

Scope of Comparisons

Alternative of Composite Movement

It should not be assumed that the most economical movement of traffic is always entirely by one means of transport throughout. It is very common for a shipment to move from origin to destination partly by one means of transport and partly by another. Such arrangements are often strikingly economical. Lake Superior iron ore moves by rail to lakeside, thence by lake vessel to lower lake ports, thence by rail to blast furnaces. This is undoubtedly much more economical than all-rail movement would be. Railroads once stopped a train at every wayside station to which a less-carload shipment was consigned. Some of them are now finding it more economical to carry the traffic by train to central points for unloading and distribute it from there by truck. In seeking

[1] The problem of bringing the several means of transport into an effective relation, so that traffic will move by the appropriate agency, is dealt with incidentally at a number of points in this report, and especially in the preceding chapter on rates. But its importance is such as to call for more integrated consideration.

[2] National Bureau of Economic Research, New York City; formerly a member of the staff of the Interstate Commerce Commission.

[3] *Report of the Committee Appointed September 20, 1938 by the President of the United States to Submit Recommendations Upon the General Transportation Situation*, December 23, 1938.

the most economical carrier for a description of traffic, therefore, the alternative cost of letting it move by a combination of means should often be included in the comparison.

The cost of moving traffic from one place to another by one means should not be compared with the cost between the same places by another means when the movement in question is only a segment of the movement from initial origin to ultimate destination. Much farm traffic is now moving by motor truck directly from farmers to dealers and jobbers. Such traffic used to move by truck or wagon from farm to railroad station, thence by rail to a wholesale receiver's place of business, thence by truck or wagon to jobber or retailer. If only the cost of movement from the place at which the traffic is put on to the place at which it is put off the railroad is considered, rail transport might appear more economical than truck. But a truer comparison will result if the cost of truck movement to and from the railroad, including the cost of transfer, is added to the strictly rail cost, and the total compared with the cost of a direct all-truck movement. The cost of handling traffic by water between ports on the Mississippi River may appear to be lower than the cost of handling them by rail between the same ports. But much of this traffic does not originate or does not terminate at the ports. It is hauled by rail to and from them. If it moved all-rail, much of it would go by more direct routes which do not pass through the ports. To determine the most economical mode of carriage, the cost of rail service to and from the ports, including cost of transfer, should be added to the river costs, and the result compared with the cost of the more direct all-rail haul.

Private Transport

Comparisons between the costs of transport by various means should not be confined to the cost of transport for hire. People travel in their own cars as well as by bus even where train or plane service is available. Farmers, manufacturers, and merchants haul their goods in their own trucks. To a lesser extent there is private transport by water, and only to a negligible extent by rail. Where private transport occurs or is feasible by one means of transport, the cost of both private and for-hire movement by that means should be compared with costs via other means. It may be that business concerns carry their own goods when the railroads could do it at less cost; on the other hand, it may be that if rail rates fully reflected costs, some traffic handled by the railroads would be handled by shippers themselves over the highways at less than the rail cost.

Government Expenses

Not all of the expenses of transport are incurred by the actual carriers, whether private or commercial. A large part of the expenditure which is necessary to highway, waterway, and airway transport is made by local or State governments or the Federal government. The relative importance of the governmental contribution varies as between these means. The contribution to railway and pipe-line transport is negligible. If one wishes to know whether a description of traffic can move most economically over a specified means to transport, one should include in the costs via that means the expenses which government will have to incur to make the movement possible.

The "Description of Traffic"

The assumption that there is a means of transport more "fit" than others to handle a description of traffic rests largely, as previously noted, on the further assumption that the cost of handling that piece of traffic by any specified means can be determined. As a matter of fact it is impossible to show accurately what addition to most classes of cost will be made if an agency handles a small bit of traffic. If all traffic is divided into many descriptions each covering a small amount, therefore, difficulties will be encountered. Attention can be confined to those costs which can definitely be shown to be connected with each amount of traffic. If this is done, it may be concluded that an agency can handle each piece at very small cost. But the costs which could be definitely assigned to all such pieces in the aggregate would amount to much more than the sum of the costs assignable to them individually. These difficulties are especially pronounced in the case of railroad costs and general-cargo water carrier costs. Considering each piece of traffic separately, and only those costs clearly associated with it, it might appear that a railroad was "fitter" than a motor carrier to handle each piece. Yet the cumulative effect on the expenses of the railroad if it were to handle all such pieces might easily be so great that it would not be the most economical carrier after all. On the other hand, if any attempt is made to estimate for each small piece the costs which cannot definitely be assigned in such small units, the conclusions as to which carrier is fittest will rest upon highly conjectural assumptions.

It might seem from these considerations that attempts to determine comparative costs should be made only for pretty broad descriptions of traffic. But there is danger in this direction also. The description may be so broad as to combine kinds of traffic between which there is a real difference as to comparative costs by various means. In such a case traffic for which the rail-

roads are most economical might be included in the motor trucks' field because the average cost for the whole broad description was lower by truck. An effort might be made to determine, for example, what the comparative cost of handling all traffic weighing less than 15 tons per consignment and moving 50 miles or less might be by rail and by truck. On its face this may look like a clear case for trucks. But the best line of division may usually be at 40 miles. And for some articles in some circumstances the railroads may have a demonstrable advantage at much smaller distances.

In summary, if traffic is divided into many narrow descriptions, the comparative costs obtainable will be partial or conjectural or both; if it is divided into a few broad descriptions, real differences in economy will be ignored.

Nevertheless, a study based on certain broad plausible classifications of traffic in terms of weight, distance, and geography might be of value. A national investigating body such as the new Board might set up a number of broad patterns of division which there is some general reason to believe might, in the large, be economical. The aggregate national cost of handling all traffic could be estimated for each pattern. The pattern which gave the lowest aggregate cost could be designated as most economical. This would create a broad presumption that any traffic falling within the description assigned to one means of transport in the chosen plan could most economically be carried by that means. Special circumstances affecting cost would justify departures. The board might supplement its general plan by indicating the nature of some cases of this sort.

The purpose of such a study should not be to provide a basis for an uncomprising division of traffic along the lines found likely to produce the lowest cost. To deny shippers the opportunity to choose a type of transport other than that found to be lowest in cost would ignore considerations of service. A preferable method of allocating traffic would be to allow shippers to choose the service they want on the basis of rates reasonably related to the costs incurred. Traffic would then go to the low-cost carrier except when those who must pay for the excess cost via another medium of transport were willing to do so. A background of comprehensive study, transcending the limits of inquiry which are practicable in particular rate-making proceedings, should assist materially in achieving such an adjustment of rates.

After such a study had been made, the technology of different modes of transport would no doubt continue to change, in unequal degree. The conclusions suggested by the study should therefore be revised from time to time so as to change the division of traffic in favor of the mode of transport which made most progress in reducing costs. In a realistic study it would probably be found that there are marginal descriptions of traffic for which no one carrier is clearly the low-cost carrier. Such margins might well be broadened to allow for prospective improvements in technology the effect of which cannot be exactly anticipated.

Appropriate and Inappropriate Methods of Computing Cost

There are many ways of computing or estimating the cost of transportation. Some of them are inappropriate to the problem of determining the most economical carrier. If these methods are followed, one means of transport may erroneously be found to be more economical than another. Some differences of this kind are of sufficient general importance to justify considering them here.

Cost of Durable Facilities

Interest and amortization on money spent in the past to provide durable facilities still in use are sometimes regarded as part of the present cost of doing business. The problem of achieving a more economical division of traffic, however, is not one of planning an entire system of transport from the beginning. A great stock of facilities—roadbeds, stations, paved highways, improved waterways—is already in existence. The money required to provide them has already been spent. The labor and material which this money commanded have already been used. These past expenditures will not be changed, whether traffic does or does not make use of the facilities. For the purpose of determining comparative economy, therefore, no allowance should be made for costs already incurred. For the future, a waterway which has been made navigable at great expense is the same thing as a waterway which is equally navigable in its natural condition.

On the other hand, some, although not all, of the existing durable facilities will eventually wear out or become obsolete. If traffic continues to move, new expenditures for durable facilities will have to be incurred. Most decisions which influence the division of traffic are effective for a long time, during which the necessity for new facilities may arise. It is proper, therefore, to include the prospective cost of new facilities.

This does not mean, however, that their costs should be included for the immediate future. Until the time for replacement arrives, the means of transport which will require them may be the more economical form; when the time does arrive, it may be that the traffic should be diverted to avoid the new costs. The relative

economy of different means may change as the need for new capital expenditures on one or the other approaches. It may be, of course, that different parts of the plant will have to be replaced at different times. In this case, in determining whether any particular replacement will be justified, it should be considered whether still further replacements of other items will be necessary to get sufficient benefit from the first. It may be, too, that the means of transport which will eventually become the less economical one has advantages in the way of service. If so, the prospective willingness of shippers to pay for the higher costs in higher rates should be considered.

The difference in method is not a negligible one. Some of the facilities resulting from past outlays are as lasting as the stream of traffic which uses them—the cost of grading a railroad, for example. It is true that some new grading is done to provide better alignment. It is also true that an embankment is washed out by a flood now and then. But it is hardly likely that a whole railroad will be rebuilt along an entirely new alignment, or that all cuts will fill up and all embankments be washed out. Hence many items of cost which would be included by the past-expenditure method would find no counterpart in the future-expenditure method. Moreover, if it does become necessary to replace a facility, the outlays required are unlikely to be the same as those made in the past. Wages and prices of materials will be different. The methods of construction will be more economical. Work of a kind originally done with pick and shovel can now be done with power scoops and dump trucks. An entirely different type of facility may be chosen to do the work. Powerful, efficient locomotives may replace antiquated or wasteful ones.

If costs of fixed facilities are counted against each means of transport only insofar as new facilities would have to be provided to handle a description of traffic by that means, the means of transport which requires a minimum of new outlays of all kinds will be found most economical.

In some cases the cost of old facilities may provide the only indication of what the cost of new facilities may be. In such cases they must, of course, be used as the basis of estimates of future outlays. Insofar as the old facilities have salvage value, that value may properly be counted as one of the costs of transport, for it can be saved if the facilities are not going to be needed to move traffic.

Allowance for Unequal Compensation of Labor

Wage rates apparently differ appreciably between different forms of transport. A carrier of one type which pays lower wage rates than a carrier of a different type is not thereby made more efficient. On the contrary, the difference in wage rates may enable it to get a larger share of business than it could get if its money costs corresponded more closely to its ability to economize human effort. On the other hand, this proposition is strictly true only if the differences in wage rates apply to comparable grades of labor. Except insofar as such comparability can be established, it is probably wiser to take monetary labor costs as they are. Where it can be established, however, the costs of one carrier should be restated so as to give the same result as if it paid the same wage rates as the other. This will tend to indicate a larger share of traffic as proper for the high-wage carrier than would be indicated by computations not thus adjusted.

In one branch of transport—motortrucking—a considerable part of the labor is still furnished by owner-operators. They may not go through the formality of crediting themselves with wages. Whether they do or not, their real compensation, insofar as it is pecuniary, consists of whatever the business earns in excess of cash operating outpayments to others. What valuation should be put on the owner-operator's labor? Suppose he is earning less than paid drivers or foremen usually get for similar work in other enterprises? In this case there is hardly any question of the employer's taking an unfair advantage of the employee, since they are the same person. The operator apparently does not feel that he could do better if employed in some other way. The intangible value of being one's own boss is no doubt a factor. It would seem wise to accept the actual compensation for inclusion in computations of total costs.

Exclusion of Taxes

All contributions by carriers to the support of government should be excluded from computations whose aim is to find an economical division of traffic. Some taxes, especially those paid by motor carriers, may be regarded as payments for transportation costs incurred by government. But since the outlays of government for transport purposes should be independently computed and included in the calculation, to add in such taxes would result in duplication, and exaggerate the cost to the economic community of motor transport. Nor would it be proper to include such taxes in lieu of governmental outlays. This would evade the question of whether motor taxes make an adequate contribution.

Other taxes are contributions toward governmental expenses other than the promotion of transport. These other governmental expenses are not appreciably augmented or diminished by the manner in which traffic is divided. Children will be provided with schooling, fire and police protection will be furnished, farmers will be paid benefits, national defense will be under-

taken. These expenses of government will go on whether or not steel goes by river instead of rail, or bricks by rail instead of highway. Insofar as taxes of this kind fall more heavily on one type of carrier than another, it means, in effect, merely that government is using the first type of carrier as a collection agency to a greater extent than the second. It does not mean that heavier costs are associated to that extent with the handling of traffic by the former carrier rather than by the latter.

Established Methods of Cost Finding for Rate Making

In the regulation of rates most parts of the traffic must be charged more than the costs which have a physical and certain connection with each part respectively. When an attempt is made to base rates of formal computations of cost, therefore, those elements of cost which cannot be directly attributed to parts of the traffic must be prorated to them on some basis regarded as fair. This is generally done by assuming that expenses of an overhead character do vary in proportion to one or another of some measurable characteristics of the traffic; e. g., gross ton-miles. Where the object is merely justice to shippers such assumptions are defensible. When the costs of different types of carriers are prorated in this way, however, it does not follow that traffic divided in accordance with costs thus allocated would in fact be carried at a minimum aggregate cost. For in many cases no causal connection between the handling of a particular piece of traffic and the incurring of the prorated costs can be demonstrated. It may be fair to prorate train-crew expenses—for example, in proportion to train-miles—and reduce this to a ton-mile basis in accordance with the type of train in which each species of traffic is usually handled. But train crews must commonly be paid for a minimum number of hours or miles. The addition of new traffic in some situations might require no new trains and might not extend the working day or length of run of any crew beyond the fixed minima. On the other hand, the movement of the same traffic by trucks might necessitate additional labor expense, particularly since a full truckload is much less than a full trainload. If, in estimating the expense of handling the traffic by rail, a proration of train labor costs were made, the cost of handling by rail might appear higher than by truck, although this was not in fact the case. Existing methods of cost finding for rate-making purposes cannot be accepted for the study of economical division without much modification or at least much study of concrete situations.

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Allowance for Superior Service and Conveniences

For a description of traffic which can benefit materially from the superior service of one means of transport as compared with another, the most economical means has not necessarily been determined when the low-cost carrier has been identified. One might endeavor to put a money value on such an advantage in service, to be deducted from the cost assigned to the means having the advantage. This would be highly conjectural, however, and it is not necessary to the achievement of an actually economical division. If the charges, or the costs to the shipper and traveler, can be made to reflect the relative costs, it may be left to the judgment of shippers and travelers whether the difference in service is worth the difference in cost.

This presumes that alternative means of transport are available to shippers and travelers on terms which reflect their inclusive costs. But the question of economical division should not be decided merely on the basis of existing facilities. One of the alternatives to be considered may involve the construction of a new means of transport and the diversion of part of the traffic to that means. Or it may be that a composite means of transport, not now the most economical, would become so if facilities were created and arrangements made for through movement. In such cases, the matter cannot be left to be decided by the actual choice of shippers and travelers, for their choice cannot be registered until the improvement has been made. And if it then turns out that potential users do not actually use the improvement extensively, the outlay for construction may turn out to have been wasted. It is therefore necessary to anticipate what the choice of users would be. If it seems likely that they would not be willing to use the new facility at rates to or payments by them which would cover its full cost, the alternative should be rejected as uneconomical. Clues to the probable choice of shippers may be found in their past behavior when confronted with actual choices in similar situations between facilities already in existence. If prospective shippers can be induced to make a careful and unbiased study of the value to them of the proposed improvement that may be still more helpful.

It may be that the process of regulation itself affects the service advantages or disadvantages of a form of transport. Confinement of motor carriers to common or to contract service only, for example, may exclude from the handling of a description of traffic a means of transport which might be able to render superior service. Considerations of economy in the broad sense would seem to require that where a serious possibility

kind exists the carrier should be [illegible] to [illegible] traffic on the basis of its [illegible] cost.

minor matter of inconvenience to other users be disposed of in the same way, because [illegible] delay passenger traffic, the advantages of second a situation does not accrue to the private [illegible] whether freight shall go by rail or truck. The [illegible] nence is not serious on multiple line [illegible] re the truck traffic moves at times of low passen- icle density. On the other hand, on narrow at hours of great traffic density, and in [illegible] it is serious. Under these circumstances, the and for motor transport as compared with rail rt of freight might be increased by some [illegible] llowance graded to suit circumstances.

resent Division May Be Uneconomic

ng in mind the considerations as to the [illegible] economical division, which have been [illegible], inquire why it should be supposed that there is ent an uneconomical distribution. There are conditions in the transport industry which may ating to produce such an effect. These operate their influence on the price of service for [illegible] he cost to shippers and travelers of providing vn service. Whatever raises the price to the private transport, via one mode relative to n another, to some extent causes traffic to move latter rather than the former. Some of these ons raise the prices via one mode of transport eneral way relative to those via other modes. conditions distort the pattern of the prices by a single mode of transport.

ad

ot on the Panama Canal, and in a few instances, the Government makes no charge rators of vessels on waterways to reimburse or the costs of maintaining such navigable cilities. Water carriers for hire are therefore ged to cover the Government's costs out of the hich they charge for their services. A shipper, dating the carriage of his goods in vessels of does not count Government outlays among the hin of providing his own transportation. Gov- does reimburse itself to some extent for the n providing highways, but how fully is [illegible] ute. Insofar as it may fail fully to reimburse, r situation exists on the highways. Rail and carriers, on the other hand, must some [illegible] types of costs out of their own prices. Water haps highway carriers for hire, therefore, are vice at prices which are lower relatively to the cost via those forms of transport than will

[illegible] the costs which shippers are [illegible] whether to carry their own goods. These modes of transport are likewise [illegible] to [illegible] cost. The result may be that traffic by a [illegible] Government-aided means of transport which [illegible] ought to be more economical.

Carriers for hire by Government-aided means are [illegible] to charge [illegible] in their period any [illegible] by the Government. Railroads [illegible] under no necessity for [illegible] by such [illegible] rates. Of itself this might do harm. For reasons previously indicated, Railroad [illegible] have supplied the capital for a [illegible] of [illegible] railroad plant and national [illegible] are [illegible] to have some return on it. This [illegible] of costs to shippers, by [illegible] and means of transport, further [illegible] of line with [illegible] compared with [illegible] on shipper costs via [illegible] modes.

Priorities

[illegible] that [illegible] Government [illegible] for [illegible] costs of transportation [illegible] for a transport agency [illegible] Priorities [illegible] of [illegible] which [illegible] with [illegible] water carriers do not [illegible] priority [illegible] which [illegible] This raises the price of [illegible] relatively to the price to shippers [illegible] of [illegible] without any corresponding [illegible] Effect [illegible] result in the diversion of traffic [illegible] modes of transport without regard to [illegible]

Wages and living costs

[illegible] Forms of transport [illegible] prices, prices and shippers [illegible] of transport may again be [illegible] relatively to those via railroad. In this case the [illegible] of transport via that former [illegible] relatively to those via the latter. [illegible] in terms of man-hours [illegible] This situation may cause a mode of transport which is more uneconomical of human effort to [illegible] traffic [illegible]

[illegible] to many working [illegible] labor than necessary. [illegible] is necessary to do a [illegible] on the same world [illegible] such work is the [illegible] of workers. If they [illegible] they [illegible] be paid. [illegible] expressly not subject

rates to the same extent. [illegible] railroad rates and hence diverts traffic. In this case, however, not only are the money costs of rail transportation increased relatively to those of other agencies, but costs in terms of time used to be lost are also increased. Any effect on rates and traffic [illegible] will be [illegible]. However, more sensitive rates would have to [illegible] railroad efficiency and a diversion of traffic to competitors. Necessarily, more [illegible] that the [illegible].

Overhead Costs

Many charges for [illegible] especially in the case of railroad transportation, have been made with only a very general consideration of cost. The result has probably been that various [illegible] in many instances have been found at [illegible] the contingent cost of handling the traffic and [illegible] the costs of competing modes of transport. [illegible] high rates for railroad competing services have [illegible] to get the business by establishing lower rates [illegible] rates. Careful analysis might [illegible] suggest that the cost of handling the traffic was [illegible] but [illegible] other modes of transport. In some instances, actual rates may have been fixed at points [illegible] prospective of other transportation agencies were willing to meet them, although these might [illegible] to handle the business more [illegible]. Similarly, the railroads may [illegible] appear by high rates to provide [illegible] transportation, although the railroads could offer it and [illegible] would be attractive to shippers. [illegible] may have been fixed at levels so low as to be uneconomical, holding traffic to the rail when the cost of other transport would be lower. [illegible] particularly likely to be found [illegible] difficulty in determining the proper overhead [illegible] a proper understanding of costs in one [illegible] most [illegible]. Vessel operators for [illegible] kinds of cargo in the same [illegible] may have created similar situations.

Unequal Burdens on Noncompetitive Traffic

The net effect of these conditions which [illegible] prices out of proportion [illegible] public aid, unequal burdens [illegible] probably have to [illegible] failure, however, that [illegible] in raising the railroad [illegible] which are [illegible] more favorable [illegible] would be made to [illegible] with each piece of [illegible] the cost of [illegible] traffic on [illegible] equal to the total. The special burdens to which roads are subject in the way of provision and maintenance of way, higher taxes, etc., are largely of a fixed nature. If rates were made in the way [illegible] it might be possible to determine the extent to which each rate, including rates on competitive traffic, has been increased by the differential burden. But [illegible] the railroad companies have often made less on competitive traffic than they have charged on competitive traffic in otherwise similar circumstances. They have been content with a lower contribution to overhead outlays from competitive traffic than they generally collect. This means that the special burdens in the way of taxation, etc., may not have been effective in diverting traffic from the railroads as might be supposed on first thought. In effect the railroads are to some extent recouping themselves for the fiscal burdens from noncompetitive traffic. This means that a railroad company must pay for its own maintenance of way, while a water competitor does not, forcing it to charge higher rates on the traffic of its business, than it would otherwise have to. But it is not forced to charge higher rates on the traffic of its business which is competitive with the water carrier.

Governmental Policy and Economical Division

The object of an inquiry such as the present is to afford some suggestions as to governmental policy. If economical division is accepted as an object, [illegible] agencies of Government to promote it, the foregoing consideration of the nature of economical division and of departures from it suggest what agencies should act. Government influences the flow of traffic in a number of ways. The bearing of each of these forms of governmental activity upon economical distribution among the means of transport may now be considered.

Construction and Maintenance

[illegible] ent holds waterways and highways [illegible] air transport. Proposals for [illegible] are always being urged upon it. If [illegible] fault to traffic can move over it, [illegible] traffic may come largely or entirely [illegible] means of transport over which it has [illegible] control. In such a case the legislators or [illegible] whom [illegible] on rates should require [illegible] the traffic via the proper [illegible] than by the means now [illegible] transportation over the [illegible] included not only the co[illegible]

agencies which will operate over it but also the costs to the Government. For example, the construction of a new canal which would handle traffic now being handled by railroad may be pondered. The question which should be considered is not, how will the costs of operators of vessels over such a canal compare with the costs of which the railroads would be relieved by being relieved of the traffic. The costs to the Government should be added to the costs of the vessel operators before the comparison is made.

The cost to the Government of construction as well as of subsequent maintenance should be included. For the money has still to be spent, and need not be spent unless the traffic is to move, in the example cited, by waterway. The cost of constructing the facilities now used by the present carriers—the railroads in the example—should not be included. For these costs have already been incurred and cannot be recovered (except for a limited salvage value) if the railroads lose the business.

On the other hand, the time may come when a large part of the facilities of existing means of transport will wear out and require replacement if the traffic is to continue to move over them. This may alter the case in favor of the proposed new facility. Thus, the construction of a new highway might accommodate principally traffic which would be diverted from an adjacent line of railway. The latter might be in good condition as a result of past expenditures. Very few outlays for the upkeep of the line are to be expected in the near future. This circumstance would tend to make the cost of leaving the traffic to the rails relatively lower than that of providing highway facilities for it. But eventually much of the railroad plant will wear out. Heavy expenditures for replacement will become necessary. After a period of years, therefore, the alternative cost of handling the traffic by rail may be greater than by highway. Applying the conception that relative costs may vary with the progress of time, the conclusion may be reached that the highway should not be built immediately, but should be put into service in time to avoid heavy outlays for replacement on the railway.

The Government is also constantly being urged to improve existing facilities—to deepen this waterway, widen that highway. Such improvements will usually attract some additional traffic to the facility from other means of transport. Usually, however, the improvements will reduce the cost or increase the convenience of movement of existing traffic. A large part of this traffic, especially on highways, is of a kind for which there is no feasible alternative means of transport. Part of it may be traffic which can move more economically via the Government facility. If the improvement may be wholly justified on the basis of the savings and added convenience to traffic of this kind, no costs should be charged against whatever further traffic might be attracted from other means of transport. If it can be so justified in part, only a part of the expense of improvement should be charged against the cost of handling the divertible traffic over the improved facility.

At all times Government is incurring expense to maintain existing facilities at their present level, at least. Lowering the standard of maintenance might divert some traffic to other means of transport. The inconvenience and expense to the traffic which would remain if the standard of maintenance were reduced, however, might justify a continuance of the present level of maintenance. If so, no cost should be charged against the continued movement of the divertible traffic by the facility.

At least in the field of waterway construction, a project has sometimes been advocated on the ground that the charges of carriers operating over it would be less than the aggregate freight charge which shippers of the expected traffic would have to pay to send it by rail. Such a comparison is faulty, in the first place, because it omits the costs to the Government; it also assumes that the rates of water carriers are representative of their costs. Even if the latter assumption be granted and even if the total with the Government costs added in is less than charges based on rail freight rates, it does not follow that such a diversion of traffic from rail to water would be economical. The rates of the railroads in such a case would usually be substantially in excess of the outlays of which they would be relieved by being relieved of the traffic. The latter can easily be less than the combined governmental and private outlays which would be needed to handle the traffic by waterway. Nor, in such a situation, are the railroad rates necessarily extortionate. For reasons previously explained, the out-of-pocket rail costs associated with any one piece of traffic, even the large piece which a waterway might take, are less than a fair proportion of the aggregate costs which must be incurred to accommodate all classes of traffic. This means that most pieces must be charged something more than their direct costs, at least if railroads are to operate successfully as private enterprises. Shippers who use the waterway, if it is constructed, may have to pay a smaller bill for transportation than otherwise. But the saving to them will be at the expense of a larger loss to taxpayers, the remaining shippers, holders of railroad securities, and workers on railroads, considering all of the latter groups as a whole. Rates should never be employed as a measure of the comparative economy of two forms of transport.

Permits and Certificates

The Government also determines in a measure what facilities may be constructed or abandoned by business enterprises engaged in transportation, what carriers may operate over public facilities, and what traffic they may handle. Such decisions may open up a new means of transport to some traffic, or allow an old one to become unavailable. In granting or withholding certificates and permits in matters of this kind, the regulating authorities have an opportunity to consider by which means the traffic may most economically be moved. When permission is sought to operate a motor-transport service over a specified route, for example, the certifying agency may well ask: By how much are the outlays of highway authorities for maintenance and improvements likely to be increased if the traffic which this operator might obtain from other means of transport is added to the burden on the highways? Considerations of economical division, however, are usually not of conclusive importance in such cases. Often most of the traffic will move by the same means of transport whatever the decision, the only question being by what routes and carriers, of the same general type, it shall move.

A carrier by one means of transport which wishes to supplement its operations by engaging in transport by another means, or to acquire control over a carrier by another means of transport, must usually obtain governmental permission to do so. Where the most economical way to handle traffic is by a combination of means, such permission may clear the way for an economical division. There is always a possibility that the same result can be accomplished by joint rates or by a contract between one kind of carrier and another. The regulatory authority should consider which is the most effective arrangement for the purpose. On the other hand, the first carrier may use its control over the second to hold traffic to itself even when the controlled carrier operates over the more economical means for the traffic. A similar danger exists in the case of direct rights to operate. A railroad, for example, might use a right to operate by highway to kill off competition. Thereafter it might hold most of the business to the rails. Public control over these matters can promote economical division.

Labor Legislation

The enforcement of minimum wage laws and of laws protecting the right of workers to organize presumably reduces somewhat the inequality of compensation between enterprises in different forms of transport. It therefore reduces many uneconomic advantages which the previously low-wage forms may have had, in bidding for traffic, because comparative money costs did not correspond in this respect to comparative use of human effort.

The National Mediation Board and its associated boards of adjustment influence the effectiveness of working rules in the railroads. These Boards could be directed by law not to sanction or uphold any rule the result of which is to waste time and effort. This would tend to minimize whatever uneconomic disadvantage in competing for traffic such rules may impose on the railroads.

Taxation

Actual or possible taxes on agencies of transport may be divided into two categories—use taxes and general taxes. Use taxes would be in the nature of charges for the use of facilities provided by Government. They are illustrated by gasoline taxes, vehicle registration fees, and Panama Canal tolls. The argument for such taxes, from the point of view of economical division, is that they force carriers using publicly provided facilities to include the cost of such facilities in their prices. The comparative prices charged via the different means of transport would more truly reflect comparative costs. It is questionable, however, whether such taxes should cover much more than the expense to Government for current maintenance. This may be illustrated by waterways. The capital expense, whether regarded as a past or a current one, of existing durable improvements will not be changed whether traffic uses them or not. To include interest and amortization charges in developing the tax to be imposed, therefore, would tend to exaggerate the cost of a division of traffic not involving the use of the waterway as compared with one which would. On the other hand, since the railroads, being private enterprises, must endeavor to obtain some return on existing investment, some offset to this necessity might properly be included in use taxes on motor carriers. The offset should be just sufficient to raise waterway rates, on the average, by as much as railroad rates may be raised by the necessity cited.

Taxation in excess of what might be required to reimburse the Government for transport expenses may be called general taxation—a contribution to the other activities of the Government. Since such taxes do not represent transport costs they should be imposed on carriers by different means of transport in such amounts that the prices charged for transport via the several means will be raised by equal amounts. In other words, the shipper should be able to make the same choice between means as he would make if neither were obliged to recover any general taxes out of prices for its services.

One method of approaching this problem would in-

volve the following two steps. The first would be to determine the extent to which the price of carriers by the various means of transport are raised, on the average, by general taxes and the necessity of earning a return on permanent investment. The second would be to tax the carriers whose rates are raised least, by amounts sufficient to leave the charges for the respective services relatively the same as if no carrier had such burdens.

By the same logic, offset taxes having a similar effect on private costs should be imposed on private transport.

It has been proposed that, over and above taxes for the use of Government facilities, motor carriers should be charged taxes equal in the aggregate to the same percentage on the investment in the highways as rail property taxes are on the investment in railways. This would not necessarily produce economical results. It might work out to unequal additions to the prices charged by highway and rail carriers, respectively.

All of the foregoing remarks apply primarily to real property taxes. It is not clear that corporate income taxes affect the level of prices charged and hence it is doubtful whether any kind of equalization is needed in this respect in the interest of economical division. Social security taxes, at any given rate, vary in proportion to employment. Economy would probably be promoted if they were levied at the same rates on carriers via all means of transport. Since they are percentages of wages, some inequality would remain as a result of differences in wage rates.

The complaint about differential taxation rises mostly from the taxes on railway real property. A change in the system of public revenue which would result in less reliance on this kind of tax would do away with much of the uneconomic effect of unequal taxation.

If, instead, such offset taxes as have been considered were to be imposed, care should be taken to see that the rates made by previously more highly taxed carriers on competitive traffic really are high enough to make a contribution toward taxation. As noted before, there is reason to doubt that their present rates do so.

Regulation of Rates

From the point of view of economical division, rates of carriers for hire by the various means of transport—i. e., their prices for their services—should be so regulated that the differences in rates between the various means would correspond to the differences in cost. Each description of traffic would then go via the low-cost means unless the shipper or traveler thought the difference in service worth the difference in cost and price. This would require that rates of all carriers be made on the theory that they had to pay for the maintenance of all facilities which they use, although carriers who use Government facilities may not actually pay for their maintenance; that all carriers paid general taxes equally in proportion to their business; and that all paid equal wages for comparable labor. Rates so made might leave carriers using public facilities, paying little taxes, and paying low wages with a broad margin of profit. This could be avoided by prescribing the same relationship between the rates, but placing all rates at a lower level than suggested. Such an alternative, however, would not enable the carriers which pay full costs, high taxes, and high wages to cover expenses. But another object of public regulation of rates is to enable carriers in each mode of transport to earn ample, yet not excessive, revenue.

There seems to be only one way out of this dilemma in rate making as long as the conditions which create it exist. That is to sanction some discrimination in the case of each means of transport between competitive and noncompetitive traffic. On some traffic, the ad-advantage in cost of one means of transport is so clear that, even if costs are imperfectly reflected in rates, its rates will be lower. On other traffic, the service advantages of one means of transport are so great that it will get the business, regardless of what is done about rates within the limits here considered. All this is noncompetitive traffic. The full-cost, high-tax, high-wage carriers can be allowed to recoup their greater outlays in these respects to a large extent from noncompetitive business. At the same time, the other carriers can be required to pass on the benefits of these uneconomic advantages mostly to the shippers of their noncompetitive business. In this way, the relative rates via the different means of transport can be brought into alinement with relative costs on that part of the traffic where it really matters from the point of view of economical division—i. e., on the divertible traffic.

If governmental policy in other fields than rates were to be more fully directed toward the ideal of economy, these difficulties in rate making would not be serious.

It is possible, of course, to confine the costs which are considered in rate making to those which are actually incurred by the carriers, including the non-transport cost of general taxes. This would make for an economy of division, the imperfections of which would have to be corrected entirely by other kinds of governmental activity. For even this limited purpose, as noted elsewhere, established methods of allocating cost are inadequate. Too many costs are assumed, without empirical evidence, to vary with one factor or another associated with traffic. If it is desired to

promote economical division, the traffic should, in the absence of service disadvantages, go to that means by which it can actually be handled at least expense. In part the improvement of cost formulae calls for field and other studies which will realistically develop the relationship between various types of cost and traffic. In part it calls for prorating expenses which are found to be really independent of traffic in such a manner that the resulting costs, while higher for each means than if only variable expenses were considered, will differ from each other by the same amounts as the variable costs alone for the different means differ from each other. The formula should also be flexible enough to recognize that a type of cost variable for one description of traffic may be differently variable or invariable for another.

Accounting

Public bodies have control over the accounting systems of carriers for hire. This power can be used to modify the systems of accounts in such a way as to disclose more fully the relationship between expenses and the factors which affect them, and the relationships, if any, between these factors and traffic. Alternative costs via different means could then be estimated with more realism. No routine of accounting, however, can ever be fully satisfactory from this point of view. The expense of the accounting itself would be too great; besides, not all the information needed can be foreseen until concrete problems arise. Reliance must be placed on occasional special studies also.

Policy as an Indication of Economy

Development of public policy in the directions suggested would make for an economical division of traffic. Conversely, if such policies were in effect the distribution could be adjudged economical, at least insofar as it is in the power of Government to make it so.

PART I—SECTION IV
PROBLEMS OF TRANSPORT ORGANIZATION
1. TRANSPORT COORDINATION

By Ralph L. Dewey[1]

Introduction

This section of the report will deal with a number of related problems having this common element: They revolve around the question of improving the organization and functioning of transportation in the United States to make it yield better and less costly service. Emphasis will center on the interrelationships of the various parts of the transport system, both within and among the agencies. These may be regarded, for the sake of convenience, as problems of coordination, a term of varied and generous coverage.[2]

Shift of emphasis in study.—During the past decade, emphasis in the study of transportation economics and public policy has shifted significantly from the examination of particular agencies, especially the railway, to a consideration of the interrelations of the five major agencies—railroad, motor, water, air, and pipe-line carriers—and of their relations, individually and collectively, to Government. The reasons for this development have been the diversion of traffic from the railroads to the newer forms of transportation; the public stake in all forms except pipe lines, because of public construction and aid and other promotional policies; and the demand by users for lower rates and better service. Although still the most important carriers of freight, the railroads have lost the great preeminence in the field of inland transportation they enjoyed before the mid-twenties. In the confusion developing out of this revolution in transportation, the public is undecided about policies to adopt in order to cope wisely with the unprecedented situation.

The rise of the newer forms has led naturally enough to opposition by the older established interests—rail investors, managers, employees, shippers tied to the rails, and other interested groups—because their savings, jobs, income, or markets, as the case may be, have been threatened with impairment and possible destruction. The disturbances have been substantial, and the disequilibrium thereby created is commonly thought to need adjustment beyond that which would likely derive in the long run from automatic processes. In order to bring order out of what seems to many to be chaos, stress is laid upon the need of welding the elements, often of a discordant character, into a system of transportation pointed toward the social objectives of the Nation.

Coordination would not create the equivalent of an unregulated trust or monopoly, or of a cartel arrangement on the continental European pattern. Monopolies, trusts, and cartels, unless closely supervised by Government, are typically designed to maintain or raise prices and to restrict service for the purpose of securing maximum net profits for those concerns and individuals already occupying the field. These devices tend to lead to waste and inefficiency because they have the effect of holding an umbrella over lax managements and obsolete or inefficient plants. New entrepreneurs who are able and willing to enter the field with a better or less costly service are prevented from doing so when trusts, monopolies, or cartels prevail. Coordination in the public interest should eliminate wastes, reduce costs and rates, and improve the quality and quantity of service to the end that shippers, travelers, consumers, and Government may receive maximum economic, national defense, and social benefits from the expenditure of natural and human resources on transportation. The advances of technology and discovery and the advantages of right size of plant should be translated into user welfare through low rates and better service. The economic importance of achieving these ends is apparent when it is remembered that the total revenues received by all for-hire transportation in the United States amount to more than 7 billion dollars each year.[3]

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[1] Principal Economist, National Resources Planning Board (on leave, during fiscal year, 1940–41, from his position as Principal Transportation Economist, In Charge, Transportation Section, Division of Marketing and Transportation Research, Bureau of Agricultural Economics, U. S. Department of Agriculture).

The author was assisted in the preparation of this report by Mr. Elmer Cerin, Assistant Economist, National Resources Planning Board.

[2] Some writers prefer to limit use of the term "coordination" in the transport field to agreements covering through routes and joint rates, pooling of rolling stock, traffic, or earnings, joint use of terminals and shops, "in short, any arrangements which enable the work of two or more roads to be done at less cost through cooperation." Baker, George P., "The Possibilities of Economies by Railroad Consolidation and Coordination," *American Economic Review*, suppl., vol. XXX, March 1940, p. 150. This usage is inadequate for our purposes because it fails to encompass such important aspects of the problem of organizing the transport system as rail consolidation and unification, transport companies embracing two or more agencies of transportation, and determination of the relative fitness and economy of the various modes to perform service.

[3] *Immediate Relief for Railroads*, Bureau of Statistics, Interstate Commerce Commission, H. Doc. No. 583, 75th Cong., 3d sess., 1938, pp. 9–10. In addition to this sum, about 13 billion dollars are spent for operation, depreciation, and taxes of private (noncommercial) carriers annually. *Ibid.*

Objectives to be sought.—We may now suggest an approach to the salient objectives which should guide private management and public bodies in their efforts to improve the transportation factor. Specific proposals should be judged by the broad requirement that they improve service or reduce costs to the public. Among the gains are increased speed without undue sacrifice of safety, increased reliability and flexibility of service, and increased pleasure and comfort for passengers. On the side of social costs it is desirable to lower capital, natural resources, and labor costs to a feasible minimum. It is also necessary to eliminate, as far as possible, death and injuries to workmen, travelers, and the general public. The objectives of a satisfactory transportation system have been succinctly and well stated by Dr. H. G. Moulton. "The primary transportation requirement (he says) may be stated very simply: We, the people, require of our transportation agencies one primary thing; namely, the movement of commodities and people in the cheapest and most efficient manner possible. In pursuit of this objective there should be no predisposition to favor any particular type of transportation agency. It is immaterial whether all traffic moves by one form of transportation or another; whether certain types of traffic are carried exclusively by some particular agency; or whether all forms of transportation are used as parts of a coordinated system. The primary requirement is that freight and passenger traffic shall actually move by the particular transportation agency, or combination of agencies, which can carry it, all elements of cost considered, in the most economical and serviceable way."[4]

It is recognized that if an effort were made to secure the ends of coordination quickly and ruthlessly, profound effects upon established or vested interests would follow. A wise policy, therefore, must necessarily provide for cushioning the effects of better organization upon adversely affected individuals and groups, without, however, seriously impeding expansion and improvement of facilities and service. The groups most likely to feel immediately the effects of further coordination are those railroad management and labor groups, and those industries and communities, largely dependent upon rail service scheduled to be curtailed or eliminated. Investors in rail facilities thus withdrawn from use are also concerned, although coordination is not likely to add to their problems; in fact, abandonment of unprofitable branch lines, for example, would benefit the security holders if net income were thereby increased.

[4] Moulton, H. G., "Fundamentals of a National Transportation Policy," *American Economic Review*, suppl., vol. XXIV, March 1934, p. 36. For another excellent statement of the public interest in a well-coordinated system of transportation, see Cunningham, W. J., "Correlation of Rail and Highway Transportation," *ibid.*, p. 48.

The promotion of coordination should also be geared to take account of its effects upon the entire economy. Two aspects of this large problem relate to the stage of the business cycle which may confront the Nation at any given time and to secular trends in the location or relocation of industry, agriculture, mining, and forestry. Obviously, the pressure for coordination will be greatest when an economic recession lessens traffic and curtails user ability to pay rates and thus creates serious difficulties for carriers and users of the service alike. So, too, the recent move in the South and Southwest, for example, to attract new industries and to compete in new markets has intensified interest there and elsewhere in the question of rates and service.

Our discussion is primarily concerned with the ends which should be achieved, rather than a description of existing transport practices or regulatory policies. The subject matter may be conveniently broken down into its component parts: railroad consolidation and unification; joint arrangements between railroad companies; and interagency coordination. There is, of course, some cooperation between carriers within each of the various nonrail agencies, but it is of relatively minor importance. It is not possible to accord equal and full attention to each of the segments of the subject. For a generation, the public has seemed to expect the most substantial benefits to come from further railroad combinations. There is also substantial public interest in the subject of the proper coordination of the various modes of transport.

Railroad Consolidation and Unification

The railroad enterprise is typically large scale in its organization and operation. While there are more than 500 operating railroads still in existence, the 30 largest carriers receive on the average about 78 percent of all rail operating revenues. The large class I carriers, 133 in all, take in upwards of 95 percent of all rail receipts. The largest railroads in this country are billion-dollar concerns and operate 10 to 15 thousand miles of line.

The movement for railroad unification.[5] The tendency toward larger railroad systems is not of recent origin. Every major railroad system as it now exists has been developed in part by combinations of smaller lines and systems. There have been at one time or another some 6,000 independent railroad concerns in the United States. What the proponents of consolidation propose is really the acceleration and the extension of these historical tendencies on an enlarged scale and according to some comprehensive plan, and they cite past accomplishments in these directions as evi-

[5] This subsection is largely the work of Dr. Burton N. Behling, formerly of the staff of the Interstate Commerce Commission.

dence of their practicability and contribution to improvement and economy in railroad transportation service.

For present purposes, it seems to be sufficient to outline briefly only the more important stages in the movement, since 1920, to develop a program for the further combination of the railroads. The year 1920 is a significant landmark for the reason that the Transportation Act of 1920 reflected a change in public policy and attitude toward the railroads. This legislation, the immediate occasion for which was the return of the railroads from Federal control to private management and operation following the wartime period with its attendant strains upon the carriers, gave evidence of real concern for the future of the railroads. To a greater extent than before, the welfare of the railroads was regarded as of public interest, and the keynote of the act, accordingly, was by positive steps to create and maintain a sound national system of railroad transportation.

Among other provisions of the Act, it was proposed to consolidate "the railway properties of the continental United States into a limited number of systems." In carrying out this plan, it was intended that "competition shall be preserved as fully as possible and wherever practicable the existing routes and channels of trade and commerce shall be maintained." A further condition was that "the several systems shall be so arranged that the cost of transportation as between competitive systems and as related to the values of the properties through which the service is rendered shall be the same, so far as practicable, so that these systems can employ uniform rates in the movement of competitive traffic and under efficient management earn substantially the same rate of return upon the value of their respective railway properties."[6] The interpretation of and the attempt to comply with these stipulations as to the preservation of competition and of established routes proved to be particularly troublesome to the Interstate Commerce Commission in its efforts to develop a consolidation plan, for the reason that the objectives sought inevitably required some alterations in the aforementioned respects. The formulation, to say nothing of the actual establishment of balanced systems, was equally difficult.

Two other points in connection with the consolidation features of the Act of 1920 are of the utmost importance. In contrast with more recent thinking about railroad consolidation, economy was not the guiding motivation for consolidation proposals at that time. The dominant aim, as previously noted, was to bring railroad systems into a balanced relation with respect to access to traffic, earning power, and return on "value." In other words, by the elimination of pronounced differences in financial strength, the intention was to rescue the weak roads. Even the strongest supporters of the consolidation policy adopted in the Transportation Act considered that possibilities for economy were comparatively unimportant, and they viewed with skepticism arguments for consolidation based on claims that great savings would be achieved.[7]

The other significant point which is essential to an understanding of later developments is that the plan for consolidation which the Interstate Commerce Commission was directed to work out was to be merely suggestive or voluntary. No power was conferred to force it upon the carriers. The original Senate bill did contain a provision for compulsory consolidation, after a lapse of 7 years from the announcement of a plan; but this feature did not survive in the Act as passed.[8] Later suggestions for enforced consolidation also have failed to command sufficient support.

In accordance with the mandate of Congress, the Interstate Commerce Commission proceeded to prepare a "tentative" plan of consolidation, which was released in 1921.[9] As required by paragraph 5 of section 5, extended hearings subsequently were held, which terminated early in 1924.

A number of factors combined to delay the preparation and announcement of the Commission's final plan, as required by paragraph 5. Consideration of the many conflicting ideas and interests that had been voiced at the hearings, followed by continuing debate both as to whether a sweeping program of consolidation was desirable and as to the specific manner in which it

[6] Section 5 (4).

[7] Senator Cummins, who was one of the strongest forces behind the consolidation movement in the twenties, testified as follows at the hearings on S. 2224 (1925), p. 73: "I would like to say at this point that as author of the bill the saving in the cost of operation was a negligible factor in my mind. There is a great difference of opinion with regard to the saving that could be effected. Some experts say we could save from 300 to 500 million dollars a year; others say the saving would be very small. That was not my purpose. The whole purpose was to keep the railroads of the country runnning at the lowest practicable rates of transportation. It was introduced because I believe that if there be not a consolidation there are just two alternatives—a large part of the railways of the United States must be abandoned, or the Government must take charge of the transportation system and operate it at the public cost.

* * * * *

"Precisely. I want to say frankly that if this bill is to be voted up or voted down on the basis of saving that would be affected by consolidation in operation alone, I have not sufficient basis for urging it, and I would like to hear the discussion go forward upon the other lines, the necessity for consolidation, in order to preserve to the people of the country an effective railroad service, without passing that service into the hand of the Government."

[8] S. 3288, 66th Cong., 1st sess.

[9] *Consolidation of Railroads*, 63 I. C. C. 455 (1921). This provisional grouping of the roads called for 19 systems, and was based with certain modications on a 22-system plan which had been prepared for the Commission by Prof. William Z. Ripley. Among other difficulties faced by the Commission was the question of how many systems to provide, Congress having stipulated merely a "limited" number.

should be done, demonstrated clearly the tremendous complexity of the task which the Interstate Commerce Commission had been asked to undertake.

Meanwhile the carriers were resorting to combinations effected by such means as purchase of capital stock, leases, and holding companies. The Transportation Act had not given the Commission jurisdiction over holding companies and other noncarrier corporations, and it was not clear whether purchase by one carrier of less than a majority of the capital stock of another carrier was sufficient to accomplish "control" within the meaning of the law. Still other circumventive devices of uncertain legality were employed by carrier interests during this period. These activities were in part intended to achieve a strategic position in regard to the anticipated "final" plan, and they also were encouraged by the fact that the Transportation Act distinguished between acquisitions of control and outright consolidations. The disposition of the former type of application, governed by paragraph 2 of section 5 if Commission approval of an acquisition was considered to be required at all, was not made dependent upon the complete plan for consolidation, whereas actual consolidations, subject to paragraph 6, had to conform to the Commission's plan, and therefore could not be sanctioned prior to the promulgation of that plan. Furthermore, the Commission believed that it could not, consistently with the policy of Congress as expressed in section 5, approve outright consolidations or mergers as merely "Acquisition of control" under paragraph 2. Realizing that adoption of any plan which it might formulate would be subject to acceptance or rejection by the carriers on a voluntary basis, the Commission did not see any advantage in proposing a plan unless some likelihood of acceptance of its terms was indicated. Encouragement therefore was given to the carriers to confer with each other in pursuit of a workable compromise agreement.[10] It also was evident to the Commission that the then existing requirements of section 5 had the practical result of delaying indefinitely particular consolidations which might be in the public interest. Faced with this dilemma, the Commission in 1925, and repeatedly thereafter, requested Congress to relieve it of the necessity to announce a complete plan, in the hope that progress in the consolidation of carriers might be more rapid if allowed to proceed "in a more normal way."[11]

Congress having failed to release it from the obligation to submit a complete plan, the Interstate Commerce Commission announced its "final" plan in December 1929.[12] In its report the Commission noted that "section 5 (5) provides that after we have adopted a plan, as we here do, we may, either upon our own motion or upon application, reopen the matter for such changes or modifications as in our judgment will promote the public interest. Such applications will afford opportunity for further consideration upon adequate and recent records of the various parts of the plan." Modifications of the plan were made thereafter,[13] notably with reference to railroads in eastern territory, and reassignments of certain roads were made in accordance with several applications for acquisition by various carriers. After 1929, however, declining earnings of the carriers generally and the wave of bankruptcies which engulfed many roads, large and small, seriously complicated the financial basis for negotiation of consolidations, and there has been scant progress along these lines to the present time.

Although the depression served to impede consolidations, there was continued interest in and advocacy of this method of "doing something about the railroad situation." For while prospects for consolidation were not favorable, the need if anything became greater as the position of the carriers became more serious. Conditions of the period also served to shift the emphasis in unification proposals to the possibility of major savings in costs of operations. One of the most notable of the consolidation plans which stressed economy and which embodied specific recommendations was the Prince Plan, announced in 1933.[14] Economies estimated to be possible if this plan were adopted will be

[10] The possibility of legislation which would have made consolidation mandatory, favored in certain quarters, apparently was a threat which gave the carriers an incentive to seek a basis for a voluntary plan of consolidation.

[11] See *Annual Report of the Interstate Commerce Commission*, December 1, 1925, p. 13; also subsequent annual reports in 1926, 1927, 1928, and 1929.

[12] *Consolidation of Railroads*, 159 I. C. C. 522 (1929). The plan proposed 19 systems, exclusive of the Canadian controlled lines and a number of terminal properties. As to the latter, the Commission said:

"Our plan does not at present contain a complete allocation of terminal properties to individual trunk lines. Generally speaking, the terminal railroad properties, wherever located, automatically fall into the aggregation of terminal properties of which they are a part. We think that consolidation should be accompanied by the unification of all terminal lines in the respective terminals. All terminal properties should be thrown open to all users on fair and equal terms so that every industry on whatever rails located shall have access to all lines radiating from that terminal, and every line carrier reaching that terminal shall similarly have access to all terminal tracks within the terminal area."

[13] In approving with certain modications, on July 13, 1932, the plan worked out by the New York Central, Pennsylvania, Baltimore & Ohio, and Chesapeake & Ohio railroads for the establishments of four systems in eastern territory, excluding New England, the Commission said: "Since the publication of our plan in 1929, and more especially in the consideration of the evidence upon this record, it has become increasingly apparent that no workable plan of consolidation in conformity with the law can be devised which calls for more than four systems in eastern territory, excluding New England." It was also observed that "actual consolidation is voluntary, and if the fruits of consolidation are to be realized within the not too distant future, this condition must be taken into consideration in formulating a permanent plan." *Consolidation of Railroads*, 185 I. C. C. 403 (1932).

[14] Prince, Frederick H., *A Plan for Coordinating the Operations of Railroads in the United States*, March 15, 1933, revised September 1933, 33 mimeographed pages.

referred to presently. Another contribution made at about the same time was the report of the National Transportation Committee, which had been created at the instance of certain business, financial, and philanthropic institutions having a vital interest in railroad securities.[15]

The depression precipitated another attempt to improve the railroad situation by legislative action. In regard to consolidation, the Emergency Railroad Transportation Act of 1933 sought, although again not altogether successfully, to bring under a uniform rule all railroad combinations, by whatever means effected, including "acquisitions" and holding companies.[16] The condition that the Commission approve unifications only if "in harmony with and in furtherance of the plan of consolidation" was retained.[17] Congress also turned in another direction in the hope of bringing about a reduction of railroad expenses and the elimination of wasteful duplication and competitive practices. Title I of the Act of 1933 established a Federal Coordinator of Transportation, who was directed to "encourage and promote or require action on the part of the carriers * * * which will avoid unnecessary duplication of services and facilities of whatever nature * * *" and "avoid other wastes and preventable expense." The Coordinator also was to engage in "the immediate study of other means of improving conditions surrounding transportation in all its forms and the preparation of plans therefor." Thus, while it was not intended that consolidation efforts be abandoned, it was anticipated that through coordination, i. e., cooperative action and joint operations among the railroads, substantial economies and improvements in transportation might be realized. Undoubtedly, small accomplishments for more than a decade in bringing about consolidations, and the "present acute economic emergency" as well, accounted for this renewed effort by a somewhat different method to encourage economy.

The Federal Coordinator made many studies and proposals which were believed to offer opportunities for large savings. Because of interest in these matters, the Coordinator's office was extended beyond the two years for which it was originally created.[18] But opposition from various sources caused its discontinuation after June 1936 and likewise has prevented the adoption by the carriers on any appreciable scale of most of the Federal Coordinator's recommendations. Some of his recommendations and the reasons for the opposition to them which developed are summarized later in this section. (See pp. 146–147, *infra.*)

The Transportation Act of 1940 made certain changes in section 5 of the Interstate Commerce Act, pertaining to railroad unifications. The most important of these modifications was the abandonment of the requirement that railroad consolidations and acquisitions conform to a complete plan of consolidation. Hereafter, the Commission may approve combinations or unifications by whatever means proposed if it finds that the transaction "will be consistent with the public interest."[19]

The Act of 1940, therefore, attempts to assure Commission jurisdiction over every device for the combination or common control of railroads,[20] but without limitation as to any master plan for consolidation. As noted previously, relief from the restrictions of a grand plan is in accord with the desires of both the Commission and the railroads, as well as other students of the problem. Whether the result will be to hasten materially consolidations which would improve the condition of the roads cannot defintely be foreseen. But there is room for doubt that this change alone will prove to be very significant, in view of the fact that the Commission heretofore has been privileged to modify the terms of its "final" plan.

Approval of unifications, under the provisions of the Act of 1940, was made subject to the so-called Harrington amendment which provides that employees of the affected carriers shall not be placed in a worse position with respect to their employment for a maximum period of 4 years. It is quite likely that this provision will retard the rate at which combinations will be made. Indeed, the Commission has recently reversed its approval of the lease of the Fort Worth & Denver City to the Colorado & Southern on the ground that the Harrington amendment made the amount of future savings uncertain and problematical, and that the

[15] *Report* of the National Transportation Committee, New York, February 13, 1933. The staff studies, conducted by Dr. H. G. Moulton, president of the Brookings Institution, and the Report of the Committee were published in one volume, entitled: *The American Transportation Problem*, 1933.

[16] The 1933 Act also repealed the requirement of the Transportation Act of 1920 that the capitalization of a consolidated company should not exceed the value of the consolidated properties. It was considered that the Commission has adequate powers under section 20a to prevent financial excesses.

[17] However, it should be noted that the Commission could modify its plan, either on application by carriers or on its own motion.

[18] The office was extended for 1 year by proclamation of the President, as provided in the original act, and for 1 more year thereafter by joint resolution of Congress, thus making a total of 3 years.

[19] The act provides that "in passing upon any proposed transaction under the provision of this paragraph (2), the Commission shall give weight to the following considerations, among others: (1) The effect of the proposed transaction upon adequate transportation service to the public; (2) the effect upon the public interest of the inclusion, or failure to include, other railroads in the territory involved in the proposed transaction; (3) the total fixed charges resulting from the proposed transaction; and (4) the interest of the carrier employees affected."

[20] It would seem that the jurisdiction of the Interstate Commerce Commission in this field is now all inclusive. Noncarrier as well as carrier corporations are included, and control, under the 1940 act, means "the power to exercise control" and "the control or management in a common interest of any two or more carriers, however such result is attained, whether directly or indirectly, by use of common directors, officers, or stockholders, a holding or investment company or companies, a voting trust or trusts, or any other manner whatsoever."

savings would be insignificant during the 4-year period in which the employees would be protected.[21] This is a particularly distressing circumstance, since the rising volume of rail traffic has already raised employment to the highest level since 1931. Under boom conditions, significant unifications could be set up without reducing the total number of workers already employed. The situation is, therefore, favorable for rail managements to promote consolidations without incurring strong labor opposition backed by favorable public opinion such as existed during the depression. But indications are lacking to date that the railroads intend to take advantage of the opportunity thus afforded them.

The broad outlines of the future trend of unification of the railroads seem, therefore, to be reasonably clear. Until present legislative policy and regulatory practice are altered in certain fundamental respects, rail consolidations of a comprehensive character are not likely to be made. We may expect to witness the history of the past 21 years largely repeating itself.

Necessary conditions for further rail unification.—Assuming that the objective is to promote additional integration of railroad organization, it is important to set forth as best we can answers to three issues. These are: first, the probable savings commensurate with satisfactory service to the public accruing from such integration; second, the extent to which concentration should be encouraged or allowed to proceed; and, third, the choice of means to bring about the desired unification.

The possibilities in terms of savings are canvassed in detail later in this section, and the subject is accordingly not developed at this point.[22] In the author's view, large economies are theoretically possible, but their practical realization would be contingent upon success in subordinating various powerfully established special interests to the general welfare, and in employing executives and personnel of sufficient ability and experience to manage very large enterprises. Obviously, it is not possible to state conclusive judgments on these questions until a given program has been tested in actual experience. For this reason, we make no attempt to evaluate the practical considerations, important as they are, involved in putting any given plan into effect. Our concern is with the question of what *might* be done in public policy to achieve certain objectives.

The ideal size of enterprise is one which will perform acceptable service at the lowest average cost.[23] It is difficult to determine in advance the degree of concentration which should be allowed to achieve such a result. Evidence of this fact is readily apparent in the differences of opinion exhibited by those who have already offered detailed plans for the consolidation of railroads into a limited number of systems.[24] Commissioner Miller, for example, proposed in 1938 that a single private railroad company be established.[25] Director General Hines suggested in 1919 that the railroads be consolidated into 6 to 12 systems.[26] The Prince Plan of 1933 called for 7 regional systems.[27] Without expressing approval or disapproval of any particular plan, the issue lies between one large system and a limited number of regional rail monopolies. The single system would doubtless maximize opportunities for economies and minimize the conflicts of competing entrepreneur interests. Yet, it might well result in a dangerous concentration of economic power in private hands. An organization embracing more than 1,000,000 employees and operating about 250,000 miles of line would also be subject to diseconomics inherent in a large and far-flung organization. This objection might be met, however, by organizing operations on a regional basis.

On the whole, it would seem preferable at the start at least to set up a limited number of regional monopolies, not more than 12 or less than 6 in number, in order to try out the program. If it resulted in definite improvements, consideration could then be given to a plan to establish 1 system. In any event, consolidation on a competitive basis ought to be frowned upon because the policy would attempt to accomplish the advantages of size and unification while retaining the wastes of competition. The result would give little satisfaction to either side of the issue of competition versus monopoly. A certain amount of rail competition would, of course, remain under a regional set-up where the various systems would touch or overlap, but it would not seriously affect operation. The vigorous promotion of other transportation agencies by Government has largely precluded the dangers of monopoly

[21] *Fort Worth & Denver City Ry. Lease*, 247 I. C. C. 119 (1941). Chairman Eastman declared in a dissenting opinion that if this reason for disapproving the lease were to be accepted, no unification "which contemplated the avoidance of waste" would be approved in the future.

[22] See Behling, *infra*, pp. 161–170.

[23] This assumes that the users or the Government are prepared to pay sufficient amounts to defray necessary expenses, including capital costs.

[24] See Behling, *infra*, pp. 162–167.

[25] Miller, Carroll (with the collaboration of Commissioner M. M. Caskie), *A Suggested Plan for the Solution of the Railroad Problem*, 1938 (27 mimeographed pages). See also a supplementary statement by Commissioner Miller, entitled: *Consolidation of the Rail Transport Facilities of the United States into a Single System for Ownership and Operation Under Private Management*, March 31, 1938 (21 mimeographed pages).

[26] *Hearings* on Extension of Tenure of Government Control of Railroads, 65th Cong., 3d sess., 1919, vol. 1, pp. 900 ff. See also Hines, *op. cit.*, p. 413.

[27] Prince, Frederick H., *A Plan for Coordinating the Operations of Railroads in the United States*, March 15, 1933, revised September 1, 1933 (33 mimeographed pages). See also *Regulation of Railroads*, Federal Coordinator of Transportation, *op. cit.*, pp. 21–29. A detailed analysis of the Prince Plan was incorporated in the report as an appendix, pp. 106–123.

operation that might well have materialized a generation ago had the railroads then been organized in the manner here proposed. If the railroads continue to be restrained from establishing transport companies, embracing one or more of the competing modes, there will be little likelihood later of an undue suppression of legitimate agency competition by water, motor, pipeline, and air carriers.[28]

The choice of means to secure the desired degree of rail unification is difficult to make, particularly under our form of government. It can be said without fear of successful contradiction, however, that the type of integration favored in this report will not be carried out on a purely voluntary basis by the railroads. Some compulsion, or threat of compulsion, by Government will unquestionably be required to get the progress under way. "My own belief," said Professor Dixon in 1919, "is that voluntary consolidation will not succeed * * *. There should be compulsory consolidation of the railroads, under Federal charters, into a relatively few systems." [29]

It is suggested that the proper regulatory body be clothed with the necessary authority to secure rail consolidation of whatever limited number is found to be desirable. Since the kind of integration we have in mind will require careful planning, the Interstate Commerce Act should be further amended to charge the regulatory agency again with the responsibility of preparing and adopting a comprehensive though flexible plan for application to the railroads.

Joint Arrangements of Railroad Companies

Extent of rail cooperation.—Besides unification and consolidation there is a great deal of rail cooperation with respect to terminals, trackage rights, through routes, joint rates, and other mutually helpful arrangements. This type of coordination has been a feature of the physical and operating and rate and service arrangements between carriers for many years. In this sense the railroads of the United States form an interconnected system, even embracing the Canadian railroads to the north. According to the Association of American Railroads, 24,000 miles of track, 263 engine terminals, 1,366 freight stations, 1,902 passenger stations, 618 yards, and 472 large bridges are used jointly.[30] In addition, many belt lines in terminal areas are owned jointly by line-haul carriers, and joint switching arrangements are common in all parts of the country.

The process of effecting cooperative arrangements among the railroads goes on continuously. In the finance dockets of the Commission, one may find many decisions respecting applications of the railroads for permission to establish or continue joint operating, trackage, and terminal arrangements of various kinds. These changes and modifications are mostly of a piecemeal variety, but their cumulative effect has been to integrate the intercarrier relationships to a surprising degree.

Work of the Federal Coordinator of Transportation.—It is evident that joint arrangements in the rail field have gone on apace. But it is not correct to conclude that a desirable state of affairs has already been reached and that nothing more needs to be done. Rail organization must be evaluated in terms of potentialities for further improvement rather than merely present realities. If the railroads are not to be consolidated into a limited number of systems in the near future, a flexible type of adjustment should be considered. The vital question is: Are there feasible possibilities for further improvement of distinct benefit to the public? And if such is found to be the case, what specific means should be employed to secure the desired ends? Students of the problem are convinced, with some exceptions, that considerable savings in costs and improvements in efficiency could be realized along cooperative lines.[31] Whether practicable proposals to realize the savings could in fact be carried out in face of the opposition of disaffected groups is problematical. The experiences of the Federal Coordinator of Transportation from 1933 to 1936 with respect to rail management and labor, as we shall see, were not such as to cause the public to be optimistic about the outcome.

The need for affirmative action relative to inadequacies in rail cooperation seemed apparent to many people by 1933. The great decrease in rail traffic caused by the business depression had drastically reduced their operating revenues. Informed and disinterested students realized that higher rates at that time would add scant revenues to those then being received, partly because of lessened ability of shippers and travellers to pay added amounts, and partly because of the increasing competition of motor, water, and pipeline carriers. Although physically interconnected in one system, the railroads with more than five hundred separate operating companies each under its own management had no effective centralization of authority. This situation had resulted in uneconomic duplication of facilities and service and in excessive roundabout hauling. The excessive duplication of facilities and services existed both in the terminals and on the line

[28] See *infra*, pp. 155–156, for a discussion of the policy of establishing transport companies.

[29] Dixon, Frank H., "Federal Operation of Railroads During the War," *Quarterly Journal of Economics*, vol. XXXIII, August 1919, pp. 626–627.

[30] Address by M. J. Gormley, executive assistant, Association of American Railroads, at Springfield, Mass., on March 25, 1938.

[31] Behling, *infra*, p. 166.

hauls, being particularly pronounced in the fast-freight and passenger business and on the branch lines.

Recognizing this situation and the need for early remedial action Congress provided in the Emergency Railroad Transportation Act of 1933 for the creation of a temporary office of Federal Coordinator of Transportation. The Federal Coordinator was authorized to make studies and recommendations for the three following purposes: (1) To bring about economies in railroad operation and elimination of waste and unnecessary expense through cooperative means; (2) to promote the reorganization of railroads in financial difficulties in order to reduce fixed charges; and (3) to ascertain the means of improving conditions surrounding transportation in all its forms.

Nature and extent of Coordinator's studies.—The Federal Coordinator (Commissioner Joseph B. Eastman) instituted studies of merchandise traffic, containers, passenger traffic, carload traffic, marketing, car pooling, empty-car mileage, freight-car repair and retirement, private cars, motive power, stored equipment, express refrigerator car pool, railroad grain elevators, selection and purchase of railroad materials and supplies, standardization and simplification of designs and sizes of equipment and supplies, labor relations and conditions, economic security for railroad employees, cost finding, and public aids to transportation. The staff also made studies of the need for a railroad clearing house, of coordination in the handling of fiscal matters, and of the need for establishing adequate port terminal and like charges. A special committee of outside experts studied the need for a central scientific and engineering research agency for the railroads. These staff studies were published from time to time and contain a veritable mine of information and recommendations for rail improvement. In addition, the Coordinator made four reports containing his recommendations for further legislation.[32]

While these matters were being considered by the central organization, the regional staffs of the Coordinator endeavored to bring about economies through better terminal operations, joint use of shops, stations and other facilities, pooling of traffic or service, and elimination of wasteful routes. This offered an immediate field for the economies envisaged in the Emergency Railroad Transportation Act of 1933. Moreover, organizations to make the necessary studies and formulate plans were brought into being at that time. However, as the desired economies depended upon significant reductions in employment, they were severely hampered by the labor provisions of the act which stipulated that the number and status of individual employees in the service of a carrier should not be reduced, by any action taken under the new statute, below the level prevailing in May 1933. Reductions of employees by death, normal retirements, and resignations were, however, not included in the totals. Regional coordinating committees were set up by carriers, and labor committees for the three regions were selected by the railway employees. The regional coordinating committees (formed by the carriers) assumed direct charge of the organization and prosecution of the investigations of economy projects and the Coordinator's staff was engaged for the most part in stimulating the studies and reviewing the results. Special major studies were made of the organization and operation of the terminals in St. Louis, Chicago, Omaha, Kansas City, the Twin Cities, New York, Atlanta, Birmingham, and New Orleans. The port situation was also examined at such places along the Atlantic and Gulf coasts as New York, Hampton Roads, Jacksonville, Mobile, and New Orleans.

The Coordinator's staff concluded that substantial savings annually could be made as follows: Terminal projects, 25 to 50 million dollars;[33] car pooling on a Nation-wide scale, 100 million dollars;[34] coordinated passenger traffic solicitation, 15 million dollars;[35] and merchandise traffic coordination, 100 million dollars.[36] On these four items the total estimated savings ranged from 240 to 265 million dollars. The Coordinator did not, however, make an estimate of the total economies which might be achieved.[37]

Results of the Coordinator's studies.—The Coordinator and his staff, other Government agencies, and rail management and labor put forth much effort and incurred heavy expense on this task. The Coordinator's office was in existence for 3 years, from June 1933 to June 1936, and some members of the staff, besides carrying on other duties, worked for another 3½

[32] First Report, *Regulation of Railroads*, S. Doc. No. 119, 73d Cong., 2d sess., 1934.

Second Report, *Regulation of Transportation Agencies*, S. Doc. No. 152, 73d Cong., 2d sess., 1934.

Third Report, *Report of the Federal Coordinator of Transportation, 1934*, H. Doc. No. 89, 74th Cong., 1st sess., 1935.

Fourth Report, *Fourth Report of the Federal Coordinator of Transportation on Transportation Legislation*, H. Doc. No. 394, 74th Cong., 2d sess., 1936.

[33] *Report on Economy Possibilities of Regional Coordination Projects*, Federal Coordinator of Transportation, February 14, 1935, p. 11.

[34] *Report on Freight Car Pooling*, Section of Car Pooling, Federal Coordinator of Transportation, October 23, 1934, p. 3.

[35] *Passenger Traffic Report*, Federal Coordinator of Transportation, January 17, 1935, p. 59.

[36] *Conclusions of the Federal Coordinator of Transportation on Merchandise Traffic*, May 1936, p. 8.

[37] After some of the early studies had been started, the Coordinator gave instructions that no over-all estimates should be made. Pointing out the debatable character of such estimates, he said that they merely invited attack by diverting attention from the basic merits of the proposals. He added that the important thing was whether substantial economies could be effected, whatever their exact amount might be.

years on the subsidy reports.[38] The surveys and inquiries covered a wide range of problems and the detailed reports and recommendations were the most comprehensive yet offered for the improvement of railway operation.

The Coordinator's studies represented primarily an examination of existing operating practices of the railroads, followed by recommendations which were designed to improve the position of the carriers. While perhaps insufficient attention was devoted to rationalization of rail plant and coordination of agencies in the broad sense,[39] the projects were in the main carefully organized and competently carried to completion. The chances are that the recommendations offered constructive remedial alternatives to existing practices and should have been seriously considered and widely adopted by the carriers.

Unfortunately the results were otherwise; the railroads for the most part ignored or opposed the Coordinator's suggestions.[40] His recommendations were termed by some railroad executives as being "visionary" and "impracticable," and he once remarked that the carriers "seemed more zealous to prove that my staff was wrong in its conclusions and recommendations than to find, with the help of our reports, ways and means of improvements."[41] The truth of this observation was demonstrated, for example, when the Coordinator attempted early in 1936 to improve the terminal conditions in 11 cities.[42] These 11 cities were carefully chosen from more than 5,000 terminal situations studied. The total operating economies were estimated at 2 million dollars a year. The 11 projects were also selected for action because of the comparatively slight dislocation which would have been visited upon rail management and labor. Moreover, prior to issuing an order to proceed with the unification, the Coordinator gave the interested parties an opportunity to comment upon the proposals. The final outcome of the matter was that the order was never promulgated, as the railroad groups (including labor) forced the Coordinator to abandon his course.[43] To disinterested students of the railroad problem, this fiasco proved beyond doubt that the railroads, when confronted by vital conflicts of interest, could not be expected further to improve their systems and lower their costs in the public interest by voluntary cooperative action under the friendly help and guidance of government. On this point the Interstate Commerce Commission said in 1938, "Nor do we believe that there is anything in their record which at all warrants a conclusion that the railroads can be dependend upon to do what should be done wholly on their own initiative."[44]

At the time the Coordinator's term expired in June 1936, the Association of American Railroads issued a statement promising to continue the coordination surveys begun by the Coordinator whenever "practicable." Regional committees of railroad officials were appointed and a few projects were carried on voluntarily. Of late, little has been heard publicly about this work; the conclusion is obvious that neither the Association nor its members have made an outstanding effort to carry out the Coordinator's recommendations or to make their own studies with a view to achieving tan-

[38] *Public Aids to Transportation*, Federal Coordinator of Transportation, 4 vols., 1938–40. Also issued after the termination of the Coordinator's office were several labor reports, one on Short Line Railroads and one on the Problem of the Thin Traffic Branch Line.

[39] It is only fair to note, however, that in accordance with a statutory provision that he consider means of "improving transportation conditions throughout the country" and transmit recommendations to the President and Congress, such action was taken.

[40] For example, in its summary of conclusions on the passenger traffic report of the Federal Coordinator, the A. A. R. Committee said, "We are unanimously of the opinion that there is nothing in the passenger report of value to the carriers for general application nationally." Quoted from Exhibit II of *Conclusions of the Federal Coordinator of Transportation on Passenger Traffic*, June 1936, p. 63. Again, on the important subject of merchandise traffic, the railroad officials showed opposition to the reports. The Federal Coordinator, in an introductory letter to Regional Coordinating Committees, said, "Since that time [submission of this Section report on Merchandise Traffic] I have received and considered two reports by special committees of railroad officers appointed to study this matter. They did not approve the recommendations of my Section of Transportation Service, for, although they conceded the existence of conditions urgently requiring correction, they felt that the application of needed remedies should be left to the individual railroads." *Conclusions of the Federal Coordinator of Transportation on Merchandise Traffic*, May 1936.

Speaking about the general opposition of the railroads to suggestions for coordination, the Federal Coordinator had this to say, "The prime reason for the slow progress to date of the coordination policy * * * has been either the inability of the railroad executives to agree among themselves, or a general disinclination on their part to act * * *. At bottom, the trouble is that the managements think narrowly in terms of their own particular roads, rather than in broader terms." Address by Joseph B. Eastman before the Traffic and Transportation Association of Pittsburgh, Pa., February 5, 1936.

[41] Address of Joseph B. Eastman before the Chamber of Commerce of the State of New York, March 7, 1935. (Mimeographed.)

[42] Worcester, Mass.; Mechanicville, N. Y.; Grand Rapids, Mich.; Jacksonville, Fla.; Montgomery, Ala.; Meridian, Miss.; Freeport, Ill.; Des Moines, Iowa; Council Bluffs, Iowa; Beaumont, Tex.; and Ogden, Utah.

[43] Taking the initiative in this controversy, the Coordinator recommended to the President that he request a postponement of the effective date of the orders and urge the rail management and labor groups to enter upon negotiations with a view of devising a plan of dismissal compensation. The President accepted the recommendations, and management-labor negotiations were begun and brought to a successful conclusion with the signing of the Washington Agreement in June 1936, by the terms of which an employee who suffered loss of job or reduction of compensation as a result of a consolidation, unification, or coordination should receive compensation for such loss. However, a part of the agreement was that both parties would urge Congress not to extend the life of the office of Federal Coordinator beyond June 16, 1936. This course of action prevailed—it was an election year—and the Coordinator was not afforded an opportunity to proceed with the enforcement of the orders. If the life of the office had been extended, it is quite possible that much progress along these lines could have been accomplished, especially in view of the agreement on a plan of dismissal compensation.

[44] *52d Annual Report of the Interstate Commerce Commission*, 1938, p. 22.

gible results.[45] This outcome of the efforts of Government to promote rail coordination was to be expected in view of the inability of a multiplicity of separate and conflicting ownership and management interests to cooperate for the common good. No one person or group is responsible for this result. Such is the situation in 1941 with respect to railroads which throughout the depression, from 1931 onwards, have complained of their financial plight and the unwillingness of the Government sympathetically and materially to aid them.

Program for further rail cooperation.—There remains, therefore, a distinct and urgent need for further relinquishment of the individualistic and competitive approach to the organization and operation of the railroads. While progress in the past, as we have seen, has been substantial, it has not proceeded fast or far enough to meet the needs of the time. Large savings are attainable through pooling arrangements, for example, in the use of equipment, in repair shop operation, and in the handling of less-than-carload freight. Likewise, the unification of terminal facilities opens the road to the increase of economies and to the reduction of wastes. These means are feasible and readily encompassable, because they do not involve large changes in the financial and legal relationships of railroads and allied enterprises as does corporate consolidation.

A pressing need for improvement today is in the movement of merchandise less-than-carload freight traffic. It seems clear that to stop losses of this traffic to competitors, as well as to promote the public interest, the services to shippers must be speeded up and made more convenient. Modern conditions require the reduction of terminal handling where possible. Fast, lightweight container cars should be provided as standard equipment. Moreover, the less-than-carload freight service should be combined with the express service as an economy and efficiency measure. Both are established on a collection and delivery basis, and if they were brought under centralized direction, better utilization of line-haul and especially of terminal facilities would unquestionably be possible. In this connection, the railroads could learn much from the freight forwarders who undertake to perform a complete service from shipper to consignee. On the face of it, the railroads ought to be in a position to do an outstanding job of this kind. In order to achieve full success in the handling of less-than-carload freight pooling of cars is very desirable.

Indeed, the pooling of all freight cars of the country on a national scale would enhance the ability of the railroads to perform effectively their functions. This step should be taken at once. It is unfortunate that the railroads have continued to overlook the excellent suggestions of the Federal Coordinator to be found in the study and report on freight car pooling.[46] The Coordinator proposed that all railroad-owned freight cars which operated in interchange service should be assigned to a general pool to be operated by a central agency controlled by the participating carriers. Under this plan all types of freight cars were to be included. The pool was to maintain the cars, distribute them equitably, schedule retirements and replacements in accordance with a stabilized program, collect reasonable rental from car users, and on taking over the cars, compensate the car owners for ownership costs.[47] By this plan savings in both operating expenses and in carrying charges would result, and the essential means of effecting coordination on a wider basis would be established. Car pooling has been resorted to in the past, and has met with some success; its public benefits are large enough to warrant its further extension as a permanent plan. To be sure there are difficulties involved in executing such a program, but they are matters of administration and organization, which can be solved in practice.

Another definite need is for a central railroad agency which would be free to perform various functions of importance to the entire industry. Some of these are

[45] The Association of American Railroads adopted a resolution on June 29, 1936, a few days after the Office of Federal Coordinator expired, agreeing to assume "the obligation of carrying forward the duties heretofore imposed on the Federal Coordinator of Transportation in respect to the continuance of these studies and the effecting, where practicable, of economies in the operation by coordination of services and facilities." The resolution also contained a request that the member roads select an appropriate committee for each of three regions "to take up the study, under present conditions, of the projects heretofore considered by the three Regional Coordinating Committees and such other projects as may from time to time be presented whereby economies in operation may be effected by coordination of services or facilities." The committees were set up in accordance with this resolution and began consideration of 703 individual projects which had been studied under the direction of the Federal Coordinator. The Coordinator's staff had concluded that these projects would, if carried out, effect annual savings of $30,695,864. The committees also took over 21 pending or reopened projects, making a total of 724 projects. By January 15, 1941, some 685 of these projects had been restudied by the committees and 29 had been made effective, involving aggregate savings of $335,671 per year. The other 656 were dropped, 15 because the facilities in question had been abandoned, and the others for the following stated reasons: (1) "increased traffic, which resulted in insufficient capacity of facilities under coordination arrangements, or which made the contemplated force reductions inadvisable"; (2) "economies accomplished by individual railroads without coordination"; (3) "cost of displacement allowances, under the Washington Agreement, would exceed the anticipated savings"; and (4) "capital expenditures not justified by the economies." *Statement* of the Association of American Railroads to the National Resources Planning Board, February 24, 1941.

[46] *Freight Car Pooling and Plan for Proposed Box Car Pool*, Federal Coordinator of Transportation, 1935, pp. 4, 5. For the details of a proposed plan of organization, including rules of operation, see pp. 40–55.

[47] Behling, B. N., *Railroad Coordination and Consolidation, A Review of Estimated Economics*, Interstate Commerce Commission, Bureau of Statistics, Statement No. 4023, 1940, pp. 16, 17. (Mimeographed.)

the day-to-day tasks which confront every single carrier, and yet which could be done more satisfactorily by a central organization. For example, the staggering amount of paper and pencil work necessary for the millions of separate shipments, each with its full report by the destination carrier, as well as a subsequent verification of all the details by the originating and each intermediate road, calls for a radical overhauling. Unquestionably, these duplicative operations can be lessened by changes in the methods now in use by the individual roads to a clearing-house system, operated through a central agency.[48]

But the essential requirement for a central railroad organization goes much beyond the mere purpose of reducing paper work. Several years ago the railroads agreed to set up a research unit for the entire industry, recognizing at that time that such a unit would aid in bringing about a more efficient operation of facilities and in reducing the wasteful practices now indulged in by the individual carrier. Although this was agreed upon some time ago, no central research organization has been formed. This error in policy should be speedily corrected in the interest of a better rail system.

In other ways a central agency can play its part to yield benefit both to the industry and the general public. Not only will the clearing house eliminate a great deal of duplicated effort but it will be in a position to perform certain fiscal functions now performed in the costly and inefficient way followed generally from the beginning of the adoption of through route service. The innumerable, unnecessary cross payments can be readily canceled by the simple use of the clearing-house system. A central railroad agency is indispensable for the proper operation of the railroad industry, the more so as the development of other modes of transport takes place.

The policy of establishing through routes and joint rates has been instrumental in knitting together the various areas of this nation. By this method, independent companies have tended to become members of one system, thereby meeting the necessities of expanding commerce and thus giving further evidence of the benefits of cooperation. Direct through routes greatly aid in the elimination of the wastes and delays of interchange and circuitous routing. But roundabout routing continues to abound in the system. The Federal Coordinator's staff found, for instance, that the average rail carload moves about 11 percent further than would be necessary, "if it were moved by a direct line route in common use."[49] Today any railroad is permitted under the Interstate Commerce Act to refuse to enter into agreements with other carriers with respect to through routes and joint rates which would have the effect of short hauling itself. This practice has resulted in a tremendous amount of roundabout routing which must be charged against a system which tolerates numerous independent concerns. Of importance also is the privilege granted by law to shippers to designate the through routes over which their goods shall be transported. The largely unnecessary practices of wide-open gateways, shippers' routing, and protection of the carriers against short-hauling can doubtless be greatly curtailed without materially affecting the choices of the users of transport facilities. The closing of the many indirect channels of movement would not make competition in service any less effective for a given shipment because there could still be sufficient direct routings to provide the necessary stimulus for furnishing prompt and adequate service.[50]

Another outstanding need for coordination exists in connection with the antiquated and often obsolete terminal operations of the railroads. By and large, the handling of freight at the terminals is "a half measure between transferring freight by hand from one line to another * * * and modern methods that should join through routes and movements."[51] Without doubt the costly unit operation of terminal facilities should not be tolerated as a part of our transportation system today.

Basically, the difficulties which are to be found in existing terminal operations can be traced to the unwillingness of individual railroads, which possess strategic advantages as to location, to surrender these benefits for the ultimate good of the public. It seems that the railroads fail to realize that whatever advantageous positions they may have are in part dependent upon statutory provisions, which can be changed if necessary to correct unsatisfactory terminal situations.

It is the inadequacy in terminal operations and their organization which has permitted practices of the most uneconomic nature to develop and flourish. Terminal unification can, if accompanied by elimination of excess facilities and employment, result in lower costs without impairing needed services. Many of the economies anticipated from terminal unification rest upon the possibility of abandoning a portion of existing facilities and retaining in use the more efficient facilities. But improved business such as has now developed would probably drastically overtax many of the rationalized

[48] *Report on a Transportation Clearing House,* Federal Coordinator of Transportation, November 1934, p. 5.

[49] *Freight Traffic Report,* vol. 1, 1935, p. 77.

[50] Turney, J. R., "The Price of Open Gateways," *Annals of the American Academy of Political and Social Science,* vol. 187, September 1936, pp. 22–26.

[51] *Second Report on Economy Possibilities of Regional Coordination Projects,* Federal Coordinator of Transportation, July 1935, p. 14.

terminals without new investment to provide needed expansion of plant and equipment. This investment may not be regarded as desirable at the moment. The prospect of securing rationalized unification of terminals is bound to be materially lessened, as long as the inferior facilities are of sufficient utility to warrant continued operation. Even so, the services joining the various terminals in a given city or area could be materially improved by such methods as those employed at Chicago during Federal Control to reduce switch-engine hours by unifying switching operations within the terminal district. The additional advantage of releasing valuable real estate for other uses should be fully considered.

Immediate progress in terminal unification would be made more likely if the procedures for consolidation were strengthened. At the same time, any emerging monopolistic trend must be controlled lest the public interest be endangered. If agreements to carry through coordination of rail terminal facilities should be delayed or become impossible, adequate provision should be made for public ownership.[52] In order to give private operation a fair trial, it would seem that extensive terminal operations could be most effectively coordinated by setting up a separate and independent corporation to own and operate the property and facilities. Since this would require the surrender of rights and privileges, which the parties concerned might prefer to retain, perhaps similar results could be accomplished with less delay by the establishment of a terminal association in which each line would participate on relatively equal terms. The suggested changes will encounter obstacles which must first be overcome before the anticipated benefits could be fully effected. Through the years the railroads have entered into numerous agreements which, although not insurmountable barriers, restrict the scope of railroad cooperation; these include mortgage restrictions, leases, and ownership of property not acquired for collective use. Nevertheless, the larger public benefit requires terminal unification. Wherever it would be necessary to leave operations to the owning lines, this could be planned for, provided the ultimate program of cooperation were not threatened or severely compromised.

Joint Arrangements Among Unlike Agencies

There is a certain amount of cooperation between transport agencies in the handling of joint traffic. The railroads, unfortunately, have frequently exhibited a tendency to hamper this development by refusing voluntarily to interchange traffic with other independent modes of transportation, or to establish through routes and joint rates or other arrangements. For example, the Federal Coordinator recommended that the Association of American Railroads be charged with the full responsibility for "creating a single Nation-wide passenger service, by appropriately unifying railway facilities, terminals, equipment, trains, and schedules, and coordinating, by contract or joint rates and arrangements, railway, highway, airway, and waterway transportation." This proposal was completely rejected as not feasible by the Association Committee, which said "Coordination is not feasible under any national or general basis. It is only possible in specific instances where, after study and analysis, a possible net saving in railroad operations can be made. That the railroads should be expected to even consider coordination with competing agencies of transportation is repugnant to the interests of the railroad owners and can only result in the disadvantage of the railroad companies and to the advantage of their subsidized competitors."[53] As will become more evident later in this discussion, the railroads usually prefer to deal with other modes of transportation, when necessary in their view, by means of operation of the carrier or control of a subsidiary concern rather than by joint arrangements with an independent company.

The coordination of transport agencies has been a characteristic feature of the system in greater or less degree for many years. The railroads have never been in a position alone to render a complete service to all shippers. The highway and the waterway both have been utilized in connection with rail routes. However, with the construction or establishment of through lines upwards of a century ago, the railroads competed increasingly with the water carriers and eventually absorbed or destroyed most of them. The railroads also reduced highway carriage to a minor role in the transport system. By the early years of the present century, the railroads dominated the arrangements for interagency service.

Rail-water arrangements.—It is highly advantageous to have rail-water routes established for many kinds of traffic—coal, iron ore, and grain in the Great Lakes region, potatoes from Maine to the Atlantic seaboard, cotton from the rural South to the industrial East, etc. There are possibly 90 rail-water routes performing services of this nature today. The benefits of joint movements involving the railroads and the oceans or the Great Lakes have long been apparent and need not be discussed at length here.

[52] Moulton, H. G., and associates, *The American Transportation Problem*, 1933, p. 844.

[53] *Conclusions on Passenger Traffic*, Federal Coordinator of Transportation, June 1936, p. 61.

The real center of controversy relates to the question of routing shipments by rail and inland waterways (canals and rivers). Indeed the future of inland waterway transportation is largely dependent upon the answer that is finally given to the question, for it is true that all-water movements are frequently impossible or so roundabout and costly as to be prohibitive to shippers. In order to survive as a major factor in transportation, the inland waterways must be able to enter into satisfactory arrangements relative to rates, routes, and the like, with railroads, motor lines, and possibly other carriers.

The importance to the waterways of such favorable relations with the railroads has received recognition by Congress. In the Panama Canal Act of 1912, the Interstate Commerce Commission was empowered to require the establishment of physical connections between rail and water carriers.[54] Facilities connecting the docks with rail lines may be required of the railroads or water carriers, if the Commission finds the situation inadequately provided for. Under section 15 of the Interstate Commerce Act, as amended by the Transportation Act of 1940, the railroads are required to establish reasonable through routes and joint rates with water common carriers.[55] Moreover, the railroads are legally directed to afford proper facilities for the interchange of traffic not only among themselves but also with water common carriers.

Besides legislation generally governing rail-water relations, the Denison Act of 1928,[56] which amended the Inland Waterways Corporation Act, provided for special treatment of joint rail-and-water rates with respect to common carriers using the Mississippi and Warrior Rivers and their tributaries. The purpose of this provision was to compel the railroads to expedite establishment of the through rail-barge rates over the system. The railroads have opposed use of the Act because of the fear that the policy would divert traffic from the all-rail routes. The Commission, however, has refused in numerous decisions to accept the rail view on the ground that the Government expects the improved waterways to be used as fully as possible.[57]

Rail-motor arrangements.—Joint rail-motor arrangements have assumed great importance in the wake of the development of the motor vehicle as a highly satisfactory means of commercial transportation. The two modes possess such characteristics, that when properly related, they furnish an economical and efficient means of handling traffic. A generation ago the passenger bus was placed in service between nearby cities and in suburban areas. At that time, the bus was a direct competitor of the interurban railways, but as its operations were expanded and consolidated into large companies, except for certain definitely local lines, it began to share traffic with the railroads. This competition flourished and still exists in vigorous form. For a time, the railroads mostly ignored the development of bus operations. But, as the volume of rail passenger traffic continued to decline in the face of this competition, and the margin of profit lessened even to losses, the bus began to appeal to the railroads as a possible substitute for train service. Some railroads purchased interests in established motor lines, e. g., Pennsylvania and Southern Pacific holdings in the Greyhound Lines, while others operated busses directly or through subsidiaries expressly created for that purpose, e. g., Missouri Pacific Railroad Co. ownership of the Missouri Pacific Transportation Co. In general, the highways over which such busses operate are within the territory served by the controlling railroad, and are managed in a way to supplement rail operations or to substitute for trains withdrawn from service. Some rail controlled bus lines are operated in territories not served by railroads, thus constituting an extension of the line. Coordination of rail and independent bus lines is rare, although such arrangements in instances of supplementary or complementary operations would doubtless be of value to the public. Owing to the reluctance of both rail and bus managements to enter into such agreements, and the absence of Government compulsion, there is small likelihood that joint arrangements of this nature will be made in the near future.

The railroad attitude towards motor trucks has followed a pattern similar to that respecting busses—first apathy, then operation or control, accompanied by reluctance to enter into joint arrangement with independent trucking concerns. The Southern Pacific and the Rock Island railroads, for example, own and directly control the operations of trucking subsidiaries. However, it is a common practice for the railroads to contract with local truckers for the movement of traffic to and from the station platform. For instance, the New York Central and the Baltimore & Ohio railroads each have contracts with independent trucking concerns. In some cases, the railroads have utilized the motor services of the rail-owned Railway Express Agency, Inc. The railways have employed trucks partly as an efficient and economical substitute for way-train service, but more importantly as a means of meeting truck competition. This competition has de-

[54] Section 6, par. 13 (a) of the Interstate Commerce Act.

[55] Previously the railroads and rail-water lines had been required to establish through routes among themselves. In 1934, for example, 89 water carriers had in force joint through rates with rail or other water lines. *Regulation of Transportation Agencies,* Federal Coordinator of Transportation, S. Doc. No. 152, 1934, p. 101.

[56] 45 Stat. L. 9978 (1928).

[57] *Through Routes and Joint Rates,* 156 I. C. C. 724, 727–728 (1929); *Application of American Barge Line Co.,* 167 I. C. C. 41, 44 (1930), 182 I. C. C. 521, 524 (1932).

veloped both in terminal and in line-haul service. The extent to which rail-motor operations have been developed is indicated by the fact that the 29 principal railroads provide such service to 8,560 stations.[58]

Rail-motor relationships between independent concerns by establishing through routes and joint rates and other mutually helpful arrangements have not proceeded far. The railroads have been as reluctant to cooperate with motor carriers as with the water lines. The railroads are not required by law to establish such relations with the motor carriers, the statute merely authorizing them to do so in their discretion. In fact, motor common carriers are not required to create through routes among themselves, except in the passenger service.[59]

The Government has recently moved to change existing rail policy insofar as it may be in violation of the antitrust laws. On October 25, 1939, the Government brought suit against the Association of American Railroads and numerous individuals and railroads, charging them with a conspiracy and combination to restrain interstate commerce. The Government claimed that the Association had adopted resolutions on September 20, 1935, forbidding its members to enter into joint through rates with common-carrier truck or bus operators.[60] Later the Association agreed to rescind these resolutions, apparently believing that the Government would then dismiss the suit. However, this was not done, and the carriers then moved for dismissal. The court refused on December 3, 1940, to concur in the motion, and the case was set for trial. The case was settled by a consent decree issued on July 18, 1941, which the Department of Justice said was expected to "restore to individual railroads freedom of action to enter into direct transportation arrangements with motor carriers."[61]

The railroads have been urged by many, including the Commission, to make greater use of the motor vehicle in the interest of economy and efficiency. However, after the passage of the Motor Carrier Act of 1935, the Commission limited new motortruck operations controlled by railroads to service auxiliary or supplemental to rail service (the Barker Doctrine).[62] In applying this doctrine, the Commission until recently permitted such operations only for the movement of traffic which had a prior or subsequent rail haul.[63] This intepretation was abandoned in the recent *Kansas City Southern Transport Co.* case on rehearing,[64] the railroads being allowed to substitute service wholly by truck for existing railway-freight service. The Commission reached this decision apparently on the ground that the truck service was not new but was merely a substitution of a more efficient for a less efficient means of transportation. The Commission seems to regard such substitution of service as supplementary to rail operations. If consistently adhered to, the new policy may lead to a significant excursion by the railroads into the motor-carrier field. It is possible that the end result will be the transformation of many rail concerns into transport companies or transport holding companies.[65]

Other joint agency cooperation.—Notice should also be taken of other joint agency arrangements, which although of relatively less importance at the moment than those already discussed, are worthy of public consideration. No opportunity to improve the coordination of the entire transport system should be overlooked by industry or Government.

In contrast with their delay in effecting rail-motor coordination, the railroads exhibited interest in air transport as soon as it showed signs of becoming commercially important (about 1926). By 1929, numerous rail-air routes were in operation, including transcontinental service between New York and Los Angeles. The volume of such traffic continued to expand into the depression. However, with the steady increase in the speed of planes, the development of safe night flying, and reduction of plane fares to the rail and Pullman level, the *raison d'être* of such coordination has lately been lessened. Indeed, it seems likely that passenger schedules in the future will be arranged to make the rails supplementary to the air carriers for the type of speedy service performed by the latter. If this is the

[58] *Railway Age*, vol. 110, May 24, 1941, pp. 946–950.

[59] See section 216 of part II of the Interstate Commerce Act.

[60] *United States* v. *The Association of American Railroads, et al.*, Civil Action No. 4551, filed in the District Court of the United States for the District of Columbia, October 25, 1939. See also answer of the defendants, December 23, 1940.

[61] *The New York Times*, July 19, 1941, pp. 19, 22.

[62] *Pennsylvania Truck Lines, Inc., Acquisition of Control of Barker Motor Freight, Inc.*, 1 M. C. C. 101 (1936), wherein the Commission held that future healthful competition between rail and truck service would be impaired if the railroads had the opportunity to enter into the kind of truck service which is strictly competitive with, rather than auxiliary to, their rail operations. The rails were permitted to operate motor carriers only when the traffic involved a prior or subsequent rail haul.

[63] *Kansas City Southern Transport Co., Inc., Common Carrier Application*, 10 M. C. C. 221 (1938).

[64] *Kansas City Southern Transport Co., Inc., Common Carrier Application*, 28 M. C. C. 5 (1941); *Louisville and Nashville Railroad Company Common Carrier Application*, is incorporated in this decision.

[65] The effects of the *Kansas City Southern Transport Co.* decision have already been felt in the decisions of the various State regulatory bodies. For example, the Department of Public Service of the State of Washington on March 6, 1941, granted the application of the Northern Pacific Transport Co., a Delaware corporation, wholly owned by the Northern Pacific Railroad Co., for the right to operate a common carrier by motor truck between Yakima and Prosser, including intermediate and off-route points. The carrier made a similar request of the Interstate Commerce Commission relative to commodities moving in interstate commerce between the same points and in the same territory. The Joint Board of the Interstate Commerce Commission recommended that the company be granted this request. *Motor Transportation*, vol. XVI, April 1941, pp. 9 ff.

direction rail-air coordination takes, it will be a deviation from the type of integration which will likely develop among the other agencies.

With respect to the movement of goods, air express service is operated jointly by the air carriers and the Railway Express Agency, Inc. The latter agency is responsible for solicitation of traffic and collection and delivery in the terminal areas. The line-haul service is performed by the air carriers, and the revenues are divided by the terms of joint agreements. This cooperation seems now to be in a process of breaking down. According to recent reports, four large air lines, American, TWA, United, and Eastern have formed a corporation called Air Cargo, Inc., to perform a complete service from shipper to consignee. This company, however, has not as yet begun actual operations; it will be interesting to observe the effects of the new arrangements upon service and rates after sufficient trial to warrant appraisal.

A few words may be said with reference to water-motor coordination. This type of cooperation should be very simple to establish, since excellent highways connect agricultural and industrial areas throughout large portions of the country with the port cities. The truck does not compete as keenly with the water carrier as does the railroad. Generally speaking, the boat is superior to the truck for moving low-grade durable bulky commodities for long distances, and the truck possesses similar advantages in the short-distance movement of high-grade or perishable products.

Numerous water-truck routes are now in operation. Steamship lines between Boston and New York have joint arrangements with truck lines throughout southern New England. Similar cooperation exists between coastwise carriers along the Atlantic seaboard and truck lines to the interior. Considerable cooperation is also reported between Great Lakes lines and trucks in adjacent territories and between Pacific coast operators and nearby truck concerns. This type of coordination offers great possibilities for the future improvement of transport service, and it ought to be encouraged in every proper way by Government.

Allocation of Traffic Among Agencies

We here treat one of the outstanding issues in the field of public policy in relation to transport. In the part just concluded, we have considered the joint arrangements of agencies for traffic moving by more than one agency. Now we turn to the quite different question of interagency relationship—seeing to it that each agency serves the traffic for which it is best fitted, or that each type of traffic moves as it should. This may be called a question of coordination,[66] but the problem must not be confused with other meanings of coordination.

In general throughout industry, choices among products and methods of production are made on the basis of competition. The business man or the consumer selects the preferable alternative. Should this method be employed in the transportation field, or should the Government or great transportation companies make the choices and determine where each agency should serve? This is the big issue, but there is the subsidiary issue of how the Government may influence the basis of competition, if the competitive method is selected. We consider the major issue first, reserving the subsidiary question for analysis in the final part of this section.

Basic to the discussion in these pages is the assumption that Government supervision should be applied to the organization of transport operations. The public has long departed from a policy of noninterference with railroad combinations and joint arrangements and with rail-water arrangements. By recent legislation the organization of the motor and water carriers has also been made subject to some regulatory control. Yet Congress has never gone so far as to rule out carrier competition or to forbid user choices among the services offered. It is not possible to offer a definite judgment upon the extent to which economically valid price and service alternatives have been made available to users. Nor is it possible to review the work of the Interstate Commerce Commission in order to evaluate the effects of its actions upon the organization of the segments of the transport industry under its control. Very likely it has done as well as could be expected considering the uncertain and at times conflicting legal directives under which it has operated.[67]

Importance of free user choices.—In order to accomplish the objective of proper distribution of traffic among agencies, the users of service should continue to be permitted to exercise a free choice among the various modes, though they be regulated as to charges, service, etc. This conception may be contrasted with a policy of positive allocation by a transport monopoly, private or governmental, or by the arbitrary failure of Government to make roads and waterways available or to grant certificates to newcomers, or by a rate policy of adjusting the charges of one class of carriers to the costs of another.

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[66] A number of writers use the term "coordination" exclusively in this sense. See, for example, Daggett, Stuart, *Principles of Inland Transportation, third edition*, 1941, p. 583.

[67] For example, the Commission was directed in the Transportation Act of 1920 to prepare and adopt a comprehensive plan of rail consolidation, yet the carriers could not be compelled to combine according to the plan.

The importance of keeping user choices free to the end that traffic may be allocated efficiently among the agencies may be made clearer perhaps by reference to a dubious line of reasoning which has lately been applied to regulatory policy. It is asserted, especially in rail circles, that the competition of water, motor, and even air carriers with railroads is unfair and uneconomic because of subsidies and other public aids to the former. One suggested remedial action to correct this alleged unfair discrimination is to regulate all the carriers in a "fair and impartial" manner. Such, for example, is the stated objective in the declaration of policy of the Transportation Act of 1940. It is not possible to quarrel with such an objective. However, if the regulation were to be applied in a way which will have the effect of positively allocating the traffic to any given type of carrier at the expense of another, it would subvert the desired social objectives.

Moreover, positive allocation of traffic through regulation should not be employed as a means of correcting unwise or unfair tax, subsidy, or other Government promotional policies. All the major agencies of transportation, except pipe lines, have been the recipients of public aids in one form or another. If Government support of a particular segment of the transportation system is deemed to be wasteful or unfair, the promotional policy itself should be modified along acceptable lines. It is difficult to believe that positive allocation of traffic by regulation would serve to correct uneconomic promotional policies. Two indefensible policies cannot advance the public interest by checkmating one another.

Transport companies.—Some of those who favor further coordination of transport facilities contend that the efficient movement of traffic by the cheapest possible means would require the establishment of transportation companies to replace present railroad companies and other carrier organizations. By so doing, it is claimed that the agency or combination of agencies of transport best fitted to perform the service would be used. It is said that the utilization of the various modes of transport would become and remain a managerial problem, since the finding of the proper place for each type of transport would presumably be the basis for such operation. The proponents claim that the users are primarily interested in moving the traffic to the destination point within the desired time, and would be willing to let management determine for itself which form or combination of forms of transport should be used for the service to be performed.[68]

Under separate and independent agencies the tendency is to retain the traffic as long as possible on the lines of a given carrier, and to relinquish the goods to others only when the step cannot be avoided. Should the government seek to curb this practice by arbitrarily fixing rates so as to make traffic move in part by one agency and in part by another, serious difficulty would be encountered because of the many complicated factors which would be involved, such as the different consignments with their varying requirements. A possible alternative method would be to transfer to the transportation companies the authority to decide upon the use of the various forms of transport.

The background and character of organization are most important as determinants of the functioning of an enterprise. There are some who look with favor upon the transformation of railroad companies into transportation companies. To the objection that the new companies would probably proceed to throttle those modes not favored by the management, regardless of transportation economies and efficiencies, one answer is that the railroad company, converted to a transportation company, would still be interested in maximum profits; and if it proved cheaper to send certain commodities, or for that matter all traffic, by truck, or bus, or airplane, or boat, as the case might be, such companies would be short-sighted indeed if they failed to use these alternative agencies. The moment a railroad company becomes a transportation company the point of view of the management with reference to using trucks, or buses, or airplanes automatically changes.[69] This, it is believed, unduly idealizes the attitude of the railroads toward the other forms of transport. The expansion of railroad companies into transportation companies might result in the subordination of the other forms of transport to the railroads, if not their entire elimination. The unwillingness of the railroads to make constructive use of the other agencies is indicated by their attitude toward possible joint services and toward the water carriers they have had in their control.

A century ago the railroads after obtaining control of competing canals, usually privately owned, would typically cease maintaining them in full efficiency, or raise tolls to discourage their use, or abandon them entirely. Moreover, the railways frequently also acquired boat lines, since they were not able to monopolize the public canals or the natural waterways of the country. This control was eventually sufficiently extensive to permit effective restriction of water transportation. The railroads also obstructed the development of waterways by buying up and controlling docks

[68] This point is discussed in Loeklin, D. Philip, "Transport Coordination and Rate Policy," *Harvard Business Review*, Summer 1937, p. 418.

[69] Moulton, H. G., "Fundamentals of a National Transportation Policy," *American Economic Review*, suppl., vol. XXIV, March 1934, p. 42.

and water fronts, and then refusing use of these facilities to the water carriers. In addition, as we have seen, the railways throttled the water lines in many instances by refusing to establish physical connections with them, thereby blocking the interchange of traffic on an efficient basis.[70] Finally, as the staff of the Federal Coordinator pointed out, "Probably the most destructive weapon of the railways was their power to reduce water competitive rates to a noncompensatory level and to recoup their losses on other traffic, including that of shorter-haul intermediate points."[71] Perhaps the railroads would today treat the other modes of transport with a better appreciation of the public interest, but their past record of dominance of water routes is such as to raise serious doubts that they would do so.

It is interesting to note that the railroads in 1933 filed a brief with the Federal Coordinator of Transportation, in which occurs this significant statement: "We must no longer think of rail transportation, water transportation, and motor transportation as separate and distinct agencies. They must be considered as having a certain relation to each other and as each contributing its part to a complete system of transportation which will benefit the public by giving to the shipper that form of transportation which he needs and which he will find most economical."[72] However, in 1938 the Committee of Six made no mention of the creation of transportation companies, indicating that by this time spokesmen for the railroads had altered their point of view and had reverted to the initial position, namely, that the railroads alone were capable of meeting all the demands for transportation service. If transportation companies are to be set up, they should be entirely independent of present carrier influence, especially that of the railroads. Merely to convert railroad companies into transportation companies might spell the doom of the other transport agencies.

In the present highly dynamic state of the transportation industry, it would be national folly to place the agencies in any kind of strait jacket. Each mode needs an opportunity to grow and change with the times. No drastic move to allocate traffic arbitrarily or to achieve a similar end by indirect means should be permitted private concerns or forced upon them by Government. The public has struggled long and taxed itself heavily to develop the newer agencies and to revive the old for the purpose of weakening the monopolistic position once occupied by the railroads and of improving and expanding the services offered to users. It would be unfortunate if public policy or private practice were now employed to halt and reverse this trend, and thus to turn back the hands of the transportation clock to an earlier time.

Relative fitness of each agency.—The feeling continues to persist that the freight and passenger traffic of the country is not now economically allocated among the various modes of transport. Evidence of this continuing belief is to be found in the views of the Committee of Six[73] and in the provisions of the Transportation Act of 1940 which sets forth a new national transportation policy and also provides for the establishment of a temporary board of investigation and research. The act seeks to provide for the "fair and impartial regulation of all modes of transportation." It states as an objective that it aims to "preserve the inherent advantages of each [mode]." Among other means of achieving these ends, "unfair or destructive competitive practices" are condemned. It now becomes the duty of the Commission to administer the statute "to the end of developing, coordinating, and preserving a national transportation system by water, highway, and rail, as well as other means, adequate to meet the needs of the commerce of the United States, of the Postal Service, and of the national defense." Incidentally, this new declaration of a national policy imposes upon the Commission a burden of statesmanship far more onerous than any previously recognized by Congress or the Commission. The Transportation Board is instructed to investigate "the relative economy and fitness of carriers by railroad, motor carriers, and water carriers for transportation service * * *"

Cost as a test of fitness.—Implied or stated in discussions of fitness is reliance upon cost as the test of price and, therefore, indirectly of allocating any given description of traffic to an agency of transportation.[74] In this way it is hoped that valid choices between the various modes can be made. The agency with the lowest cost would be the "fittest" or most economical. But is cost, assuming it can be ascertained, the sole or prime test of "fitness"? Certainly service factors such as speed, safety, and convenience weigh heavily in the

[70] Locklin, D. Philip, *Economics of Transportation*, revised edition, 1938, pp. 708–710.

[71] *Public Aids to Transportation*, vol. III, 1939, p. 18.

[72] *Regulation of Transportation Agencies*, S. Doc. 152, 73d Cong., 2d sess., 1934, p. 74.

[73] As an ideal, this group of six railway and labor executives favored "an orderly and proper development of a national transportation system in which each of the various agencies will be utilized in the way and to the extent that is justified by sound economic considerations." See Report of Committee to the President, December 23, 1938, p. 8.

[74] Of course, traffic might conceivably be allocated by Government authority among carriers and agencies, either according to cost and service characteristics or regardless of economic considerations. So far as the author knows, however, there is little or no serious support for such a policy, probably because of widespread doubt concerning the wisdom of granting power of this magnitude to individuals, no matter how able, experienced, and honest they might be. Experts and laymen alike continue to believe that allocation of traffic should come as a byproduct in the functioning of the market, even though the state may step in to control or influence that market or group of markets in varying ways.

scales, especially where perishable or valuable freight is involved. Moreover, the existence of powerful vested interests interposes significant curbs on the use of costs in pricing and allocation of traffic. Then there are people who fervently believe in a small-scale, competitive system and are willing to sacrifice a good deal of efficiency, if it means monopoly or bigness, in order to preserve a nation of numerous small, independent entrepreneurs.

It should not be assumed in any given instance that the most economical movement of traffic is necessarily furnished entirely by one means of transport. It seems likely, as we have already observed, that much long-distance traffic is susceptible of successful handling by joint-agency movement. Hence alternative cost comparisons should not be confined to one agency alone but should include feasible combination routes of two or more agencies. Furthermore, the cost comparisons should not be for a complete movement from shipper to consignee by one mode and for one segment only of movement by another. For instance, there is much direct marketing of farm products and livestock by truck from farm to urban wholesaler, jobber, or retailer. The traffic once moved by truck or wagon from farm to the local rail station, there to be shipped by rail to market, and finally by truck or wagon to the dealer. It is important, therefore, not to compare the cost of the rail haul in such instances with the cost of the truck movement. The same word of caution also applies to rail-water and truck-water comparisons.

There are many other aspects of these cost comparisons which are worthy of note. With the rise of private carriers in the motor and water fields to a position of importance, comparisons as to cost should no longer be confined to the for-hire carriers. Government expenses incurred for the construction, improvement, and maintenance of transport facilities should also be added to get the inclusive costs. Traffic can, of course, be defined narrowly or broadly. If a small amount of traffic is involved, it is almost impossible to ascertain the over-all costs of handling, because of the troublesome problem of allocation of overhead costs. If, on the other hand, the description of the traffic is broad and the area covered is extensive, there is danger that kinds of traffic with real differences as to comparative costs will be combined. However, the only feasible alternative is the second one mentioned. Although the difficulties are formidable, it might be possible to develop cost data on certain broad plausible classifications of traffic in terms of distance, weight, loading characteristics, special services required, and geographical location. This is a matter to which the new Transportation Board might well devote considerable attention.[75]

Inadequacy of the average, inclusive cost test.—But the real question at issue relates to the use to which costs are to be put in the determination of prices and the allocation of traffic. Even if agreement could be reached on a practical method of defining and allocating all costs to specific services, would it necessarily follow that the particular rates to be charged by each agency (or each carrier) should be fixed solely or largely with reference to the average unit costs of each agency (or carrier)? In spite of its surface attractiveness as a convenient and seemingly precise instrument for solving this problem, the public is advised to exercise great caution in making such employment of costs.[76] Demand and competitive factors must be accorded significant weight in rate making. If this policy is not followed, plant and equipment will not be utilized to the extent that would otherwise be feasible and desirable.[77] A large portion of the costs of the railroads, for example, have been fixed or indirect in character and not susceptible of allocation to any given description of traffic. Unless such an industry is operated up to efficient capacity (least average unit cost) its marginal or incremental costs are less than the average unit costs. Any increase in traffic under such circumstances, which brings in sufficient revenue to more than cover the marginal costs, is profitable to the carriers. It likewise helps the other users of the service by lessening their share of the burden of fixed overhead costs.

It is well known that many railroads are not today operating at capacity. Some of these were overbuilt at the beginning of their history to such an extent that traffic never developed enough to permit full operation. Others followed high rate or limited service policies which had the effect of uneconomically restricting use of the fixed facilities. Still others become more or less obsolescent in time because of the exhaustion of natural resources in their territory, or the rise of competing forms of transportation, or the shifts in

[75] For a detailed treatment of the practical difficulties of determining proper classifications of traffic for purposes of computing costs, see Hultgren, Thor, "The Nature of an Economical Division of Traffic", Part I, Section III, 2, this report. See also the same paper for discussion of appropriate and inappropriate methods of computing costs, allowance for superior service and convenience, uneconomic division of traffic at present, and the influence of Government policies upon the economic allocation of traffic. For a theoretical discussion of the part cost of service might play in the determination of rates to facilitate transport coordination, see "Rates and Rate Structure," Part I, Section III, 1, this report.

[76] For a somewhat different judgment on the use of cost in competitive pricing, see Locklin, *ibid.*

[77] Dewey, Ralph L., "The Transportation Act of 1940," *American Economic Review*, vol. XXXI, March 1941, p. 21.

the location of industries. But quite apart from errors of calculation about the right sized transport plant, it is often necessary to make large capital outlays in order to accommodate even a small additional volume of traffic. The preparation of a right-of-way or the construction of bridges and terminals is an expensive undertaking. Yet service cannot be begun until such facilities are provided. Thus investments tend to be "lumpy" in the railroad field and cannot be readily expanded (or reduced) in proportion to changing demands for service. Hence, in order to maximize the economic utilization of facilities, demand and competitive factors must be recognized in pricing.

In addition to this characteristic, the railroads exhibit tendencies toward jointness of cost. They carry many different kinds of traffic under varying conditions. To marked degree, their traffic is unbalanced, resulting in empty car backhauls. Here is true jointness of cost. If the traffic will bear something more than incremental operating costs in such circumstances it will enhance carrier profits without doing injury to the public.

On practical as well as theoretical grounds, therefore, rate making in terms of full average unit costs would be socially undesirable. This would be true even if the public could agree upon a satisfactory method of allocating fixed overhead costs to each description of traffic. The use of cost as an instrument of public policy in the fixing of particular rates should be limited to one set of circumstances, i. e., the employment of marginal costs to fix minimum rates and thus to hold in check tendencies toward ruinous competition. Beyond this, the use of cost in rate making where facilities are already available is likely to lead to their underemployment.

Feasibility of a Permanent Government Agency to Promote Coordination

It seems clear that there will be a continuing place for every major form of transportation, because each has cost or service advantages over the others for some portion of the traffic. The difficult practical problem is to keep the transport system efficiently organized and yet sensitive to the changing demands of commerce. Final, conclusive solutions cannot be devised at any given time or place; the problem is too complex to yield to intermittent treatment. For this reason, a permanent agency of government, apart from the Interstate Commerce Commission, should be established (*a*) to make continuous studies of the transport problem, (*b*) to keep the President and Congress informed about the progress and problems in transportation, and (*c*) to take appropriate action when necessary with a view of promoting the public interest.[78]

These duties might be lodged in a revived Office of Federal Coordinator or in a Transportation Authority similar to the one suggested by the Committee of Three.[79] Perhaps a more useful procedure would be to set up a Department of Transportation because of its greater responsibility to the Chief Executive and its greater prestige with the public. The direction of the work would be more concentrated and the responsibility for success or failure could accordingly be more easily fixed. The quasi-judicial functions of the regulatory commission should be left in independent hands, so that questions of rates and discriminations would be passed upon as objectively and impartially as possible. This would leave in executive hands the research, promotion, and planning functions relative to taxes, subsidies, carrier economy and efficiency, public construction of new facilities, expansion of services, and cooperation among the modes of transport.

It is imperative that the executive have the power to compel private interests to give way to paramount public welfare, if such exercise of sanctions is found to be necessary. The author is aware, of course, of the special safeguards to the interests of private individuals and corporations afforded by the Constitution in the fifth and fourteenth amendments. The courts, sustained by public opinion, have accorded strong protection to these constitutional rights. Yet, the Supreme Court has long recognized the supremacy of the public interest in treatment of railroads and other public utilities. In *Smyth* v. *Ames*, for example the Court said, "A railroad is a public highway, and none the less so because constructed and maintained through the agency of a corporation deriving its existence and powers from the State. Such a corporation was created for public purposes. It performs a function of the State. Its authority to exercise the right of eminent domain and to charge tolls was given primarily for the benefit of the public."[80] An even sounder and

[78] Commissioner Eastman has long recognized the desirability of setting up a public body to carry on these functions. For example, he said in 1938: "There is sore need for a well-equipped agency of the Government which will not be submerged by quasi-judicial procedure and which can keep closely in touch with conditions, locate those which are dangerous or unsound, foresee tendencies and their probable results, advise Congress and the President, promote changes for the better, and guide development along sound lines." *Transportation*, a speech delivered before the Harvard Business School Alumni Association, Cambridge, Mass., June 17, 1938, p. 16. (Mimeographed.)

[79] This Authority was to have a life of 2 years, with an extension of an additional 2 years at the discretion of the President. Its functions were those of "planning, encouraging, and promoting action by railroad companies with a view of eliminating the waste caused by the fact that the railroad system of the Nation is owned and operated by a large number of independent companies." *Immediate Relief for Railroads*, H. Doc. No. 583, 75th Cong., 3d sess., 1938, p. 20.

[80] 169 U. S. 466, 544 (1898).

more generally applicable basis for the right to regulate derives from the judicial concept of "industries affected with a public interest."[8] The title to waterways, natural or artificial, rests in government. Likewise it is universally recognized in this country, as it is all over the world, that the highways used by ordinary vehicles should be owned by the Government. Thus it would seem evident that the executive branch of the Government should be able to exercise the rights of sovereignty in order to curb special private interests in the field of transport when they are found to be incompatible with the proper development of the public interest. These decisions should, however, be made subject to judicial review so that the legitimate rights of individuals would not be impaired or destroyed by a capricious or arbitrary administration.

The public has suffered grievously from a deficiency of leadership on the part of transportation executives, especially in the rail field. These executives have spent too much time and attention on plans for the restriction of their competitors or potential competitors and too little on the development and improvement of their services and the lowering of their rates. At fault, too, have been labor unions, shipper interests, and localities, each seeking to secure an advantage without proper regard in many instances for the public welfare. It is too much to expect, perhaps, that any private or local group will exhibit qualities of statesmanship in the disposition of problems in which their vital interests are at stake. The Government alone is in a position to understand, represent, and protect the public interest. It is to be hoped that government will rise to its high responsibility in dealing with the cluster of questions under consideration in this report.

Conclusions

1. The need for welding the various elements of the transport system into a more efficient and economical whole than prevails today is apparent. A coordinated and rationalized system fostered by government is deemed to be desirable, providing it does not result in cartels or monopolies designed to restrict services and to maintain and raise rates for the purpose of providing maximum net profits for those individuals and concerns already occupying the field. In endeavoring to achieve the objective of a properly organized system of transportation, there should be no predisposition to favor one mode or another, by unfair or unwise promotional or regulatory policies. Provision should be made for the amelioration of the effects of coordination upon individuals and groups, especially the employees and disadvantageously situated shippers and travelers, who are not in a position to face rapid changes unaided. Concern for the welfare of these groups should not, however, be permitted to interpose undue obstacles in the way of effecting desirable improvements in facilities and services.

2. Our analysis shows that very significant savings are theoretically possible if the railroads were properly consolidated. Whether these savings would be realized in practice is a question which can be answered definitely only after an actual trial of some specific program. The more than 500 separate, competitive railroad companies should be replaced by a much smaller number, preferably not more than 12 or less than 6 integrated systems, operated on a regional basis. A single unified system under private management should not be established, pending a trial of a limited number of regional monopolies. In order to effectuate this result, 2 policies must be adopted: First, the regulatory body will have to be clothed with the power to compel, if necessary, the railroads and others to conform to its plans; and second, Congress should again require the regulatory body to prepare and adopt a comprehensive plan for the consolidation of the railroads.

3. While there is extensive rail cooperation in respect to through routes, joint rates, trackage rights, joint use of terminals, switching agreements, and other mutually helpful arrangements, the need for further integration of the organization and operation of the railroads is urgent. Pressing needs today are for improvement in the handling of merchandise less-than-carload freight and integration of this service with express and freight forwarder services, establishment of a centrally controlled national freight-car pool, creation of a central rail agency to perform such functions as research into the elimination of wastes and inefficiencies and clearing of interline transactions, reduction of roundabout routing to a feasible minimum, and, above all, improvement of the antiquated and wastefully operated terminals in our chief population and commercial centers.

4. Cooperation between the railroads and other independent agencies on a voluntary basis has not been marked, owing largely to the tendency towards exclusiveness on the part of the railroads. The railroads have been compelled, however, by legislation to enter into agreements with water carriers as to joint rates and through routes and interchange of traffic. Rail-motor arrangements between independent carriers are less common, because the law does not require the railroads to make such agreements. The railroads, however, own or control numerous water and motor lines, and have

[8] *Munn v. Illinois*, 94 U. S. 113, 126 (1876).

furnished various nonrail transport services (line-haul and terminal) for many years. Care must be exercised in allowing the railroads to control or operate competing forms of transportation, for there is danger that the public interest will not be accorded due consideration under such circumstances. Government should take all proper steps, however, to promote and supervise the establishment and maintenance of socially advantageous joint arrangements between the various modes of transportation.

5. It is a matter of the utmost public importance that each agency of transportation serves the traffic for which it is best fitted, or that each type of traffic moves as it should. In order to accomplish this objective, users of service should be permitted to continue to exercise a free choice among the modes, even though they be subject to regulation of charges, service, etc. A policy of positive allocation of traffic should be avoided whether it were to be achieved by a transport monopoly, public or private, or by the arbitrary failure of government to make roads and waterways available or to grant operating authority to newcomers, or by a rate policy of adjusting the charges of one transport agency to the costs of another. Nor should positive allocation of traffic through regulation be employed as a means of correcting subsidy, tax, or other Government promotional policies deemed to favor unjustly any one mode of transportation at the expense of another.

6. A permanent Government agency, independent of the Interstate Commerce Commission, should be established to promote and regulate rail consolidations and intercarrier and interagency arrangements. It should make continuous studies of all phases of transport organization and operation and report its findings and recommendations to the President and the Congress. Subject to the judicial review of its actions, the agency should be clothed with the necessary power to enforce its decisions. These duties and powers might be lodged in a revived office of Federal Coordinator or in a Transport Authority, but a preferable arrangement would be to incorporate such activities in a Department of Transportation with cabinet rank. The quasi-judicial functions of regulating rates and discriminations should be left in independent hands.

PART I—SECTION IV
2. ECONOMIES FROM RAILROAD CONSOLIDATION AND COORDINATION

By Burton N. Behling[1]

Proposals which have appeared during the past two decades for the consolidation and coordination of the nation's railroads according to some comprehensive plan have been premised on the belief that there is need for drastic action to rationalize the organization and operation of the railroad system. Among the objectives that have been variously emphasized by proponents are the strengthening of the railroads financially, the improvement of service, and the reduction of the cost of conducting railroad services in order to permit a lower level of compensatory charges. The issues involved in coordination of the transport system as a whole have been treated comprehensively in the preceding chapter. Consideration will be given here more particularly to the possibility of realizing economies from the consolidation and coordination of the railroads.

With reference to economy, the central argument for consolidation or coordination is that the railroads acting solely as individual enterprises cannot adequately meet the difficulties that beset them and cannot establish the most effective national system of railroad transportation. In this view, the essential requirement is for joint action directed to the elimination of wastes and unnecessary expenses which result from duplication of railroad facilities, operations, and services. The case for unification reduces, therefore, to the contention that the existing railroad structure falls far short of maximum efficiency because duplication and competition are carried to the point of great waste without sufficient offsetting public gains from this competition.[2] As to the latter point, it frequently has been observed that the lessening of rail competition would not introduce monopolistic tendencies harmful to the public or deprive the railroads of the tonic of rivalry for traffic, because competition now is afforded by other well-established forms of transportation. It can at least be conceded that the need for competition among railroads is not now so great as formerly, when carriers by rail almost completely dominated the field of transportation.

While many students of the problem are in agreement that some program of unification for the railroads is desirable, there has been no clear consensus as to how far the concentration should be allowed to go or as to the best plan for unification. In general, the proposed methods are two. Coordination, as the term is used here, refers to cooperative or joint action by two or more carriers in their common interest, at particular places or with respect to particular operations or use of facilities, but without actual unification of the companies.[3] Examples are common use of passenger or freight terminals, pooling of cars, or the joint handling of merchandise less-than-carload traffic. The Railway Express Agency which is wholly owned by the class I steam railways, is an actual case of coordinated control and operation. Although the discussion at this point is limited to railroad coordination, it may be noted that transport coordination frequently is used in a broader sense to include joint arrangements between different types of transportation, for example, between rail and highway agencies. These broader aspects of coordination are considered in other chapters of this report.

As distinguished from coordination, consolidation accomplishes an actual unification of companies under single ownership, so that they can be managed and operated as a unit.[4] With respect to possible economies in railroad operation, the significant matter is whether the properties of the constituent companies are brought into one organization for management and operation. A difference may be noted between outright consolidation of railroads in the narrow or technical sense, as defined above, and other forms of partial combinations and financial relationships effected through such means as stock ownership, lease arrangements, and holding companies, which more often than not have been designed primarily for purposes other than operating integration and efficiency. It is the former kind of unification that is contemplated in the various proposals that have been made for the consolidation of the railroads according to some comprehensive plan.

[1] Economic and Statistical Analyst, Bureau of Statistics, Interstate Commerce Commission.

[2] The Interstate Commerce Commission in its anuual report to Congress in 1939 referred (p. 14) to "the problem of the great wastes in railroad operation which are now conceded to exist and which grow out of the fact that there are such a throng of separate and independent companies which duplicate and multiply services beyond any public need, and indeed to public disadvantage, and which find it impossible to cooperate adequately in the accomplishment of various common ends."

[3] Cf. Interstate Commerce Commission, *52d Annual Report*, 1938, p. 14.

[4] *Ibid.*

Estimated Savings from Railroad Unification

In view of the fact that unification according to some systematic and comprehensive plan has been widely advocated as a means for improving the condition of the railroads by substantially reducing costs of operation and facilities necessary for the adequate performance of service, it is important to inquire as to the magnitude of the expected savings. Some of the proposals for the consolidation or coordination of the railroads have been supported by rather specific estimates of the economies thought to be possible.

These figures range from a minimum of about $200,000,000 to an outside maximum of $1,000,000,000. But in spite of differences in the proposed degree and method of unification, and although the estimates represent the judgments of various persons, there is some evidence of agreement among those who have made commitments as to the magnitude of anticipated savings. These estimates tend to center at about half a billion dollars of annual savings. The reason for this consensus is not entirely clear, although all of the plans, to be sure, have in common the principle of greater integration in the organization and operation of railroad transportation. It may be that the estimates in some degree have influenced one another.

As an expression of the significance of these estimated savings, it may be noted that each $100,000,000 of economy achieved through railroad unification would be equal to about 3 percent of the operating expenses of all operating steam railways for the year 1939. Savings of $500,000,000 would amount to about one-sixth of the operating expenses for that year, and would have reduced the operating ratio from 0.729 to 0.608.[5] Savings of half a billion dollars also would have increased net railway operating income from $638,766,000 to $1,138,766,000 for 1939, and would have been equal to more than 75 percent of the fixed charges of the carriers.

What the savings actually would be must still be regarded as problematic; their very accurate prediction probably is impossible. In making such estimates, so much depends upon the manifold details of the proposed plan for organization and operation; the qualities of the services contemplated; the future volume of railway traffic; the transportation capacity of facilities required to cope with peak periods as well as more normal needs; future technological as well as economic changes affecting transportation; and, finally, the imponderable question of whether or not much larger railroad systems or arrangements for coordination would result in complications, diseconomies, and general unwieldiness which would offset potential savings in other directions.

But while these factors cast doubts on the precise accuracy of estimated savings, the evidently great duplication of railroad facilities and services and the costly competitive practices of the carriers favor the contention that economies substantial in amount are possible. Even if the estimates ranging upward from $500,000,000 are distrusted as unwarrantably optimistic and consequently are rather severely discounted by as much as one-half or even more, the remainder still is worthy of the most careful consideration.

No comprehensive estimate has ever been presented, either by the railroads or others, of the savings which might result from the consolidation of the railroads in accordance with the official plan formulated by the Interstate Commerce Commission.[6] In certain instances, however, the proponents of other consolidation plans have ventured to estimate the anticipated savings.

Of these other detailed proposals for the consolidation of the railroads on a comprehensive scale, the most widely discussed has been the Prince plan, designed under the direction of J. W. Barriger III, and released in 1933.[7] The principles underlying this plan were that direct carrier competition is necessarily confined chiefly to major centers; that railroad competition at local points is exaggerated and is wasteful where it exists; that rail transportation suffers from light traffic density and resulting high costs; and that direct railroad competition for the most part no longer is required to protect the public interest, because of competition from other kinds of transportation. To concentrate traffic for efficient handling by the most direct routes, the Prince plan outlined seven large systems—two in the East, two in the South, and three in the West. It may be noted that potential economies were limited under this plan by the fact that overlapping systems to provide rail competition at major centers in each region were projected. Hence, this proposal was based upon the principle of regionalized but competing systems with some crossing of regional lines.

Detailed estimates of savings were confined mostly to the two Eastern systems, and this estimated percentage reduction of operating expenses was applied to the systems projected for other regions. On this basis, the aggregate savings were estimated to be $743,489,000,

[5] It is not always clear whether the various estimates of savings refer entirely to operating expenses or whether they are in part attributable to the elimination of a return on capital invested in facilities which would be abandoned as a result of unification.

[6] In certain cases, however, the carriers have offered estimates of savings in connection with proposed unifications of certain properties according to the specifications of the official Interstate Commerce Commission plan.

[7] Prince, Frederick H., *A Plan for Coordinating the Operations of Railroads in the United States*, March 15, 1933, revised September 1, 1933, 33 mimeographed pages.

or about 30 percent of total railway operating expenses for 1932. This amount also is equal to nearly 25 percent of the railway operating expenses for 1939.

At the direction of the Federal Coordinator, an analysis of the Prince plan was made by William B. Poland, in collaboration with regional coordinating committees composed of railroad officers. Their conclusion was that the savings claimed for the Prince plan were too generous, and a counterestimate of $218,462,825, also on the basis of 1932 traffic, was offered.[8] Thus, the latter estimate reduced by more than two-thirds the figure contained in the Prince (or Barriger) study.

In explanation of this drastic reduction, the Poland report stated: "The differences arise from decreased savings in train mileage; in expenditures for maintenance of way and equipment; in abandonment of facilities; and in terminal unification." It was believed necessary to allow liberally for reserve capacity to handle a possible increase of traffic (1929 plus 20 percent) in order to guard against inadequacy of lines, equipment, and terminal facilities. It also was pointed out that the percentage of operating savings for the two Eastern systems seemed to have been applied to the systems in other parts of the country without sufficient allowance for different conditions; that savings would be difficult in the South except by the abandonment of a large amount of mileage; that the greatest reduction in economies was accounted for by the unwillingness of the committees to accept the severe reductions in train operation proposed in the Prince plan; and that "considerable sums were listed as economies in maintenance by means of reducing principal routes to secondary or branch lines, where actually the maintenance expenditures on first-class lines in 1932 were shown later to have been less than normal branch-line expenditures, and there were no savings."

The Federal Coordinator questioned the desirability, on grounds of national policy, of extreme regionalization and further concentration of competition, and probably in consequence, of industry at major centers. A majority of the Poland committee thought that the proposed systems would be too large for efficient management. Nevertheless, about half of the committee favored the Prince plan, either in principle or as to certain of its features. and most of them regarded their own economy estimate as rather low.[9] It was believed, for example, that there might be large savings in future capital expenditures as well as in operating expenses and taxes. Weighing all of the factors, the Poland report concluded: "It does not seem probable that on the basis of 1932 operations the total economies could be in excess of the estimates based on the committee reports by more than 50 to 70 million dollars, possibly 25 to 30 percent of the estimates given by the committees. * * * Estimates concerned with radical reorganizations of the kind herein discussed involve new traffic situations, psychological reactions, and personal opinions to an extent which make it necessary to accept any figures presented with great reserve."

The most drastic plan for the reorganization of railroad facilities would consolidate all of the carriers into a single unified system. References to this possibility are not all of recent origin.[10] In 1938, Commissioner Miller of the Interstate Commerce Commission suggested that a single unified railroad system under private ownership and management would achieve necessary economies without resort to public ownership. Directing attention to the fact that in the 20 years from 1916 to 1936 railroad investment in road and equipment increased more than 50 percent while freight traffic declined 25 percent and passenger traffic and revenue even more, he concluded: "As the railroads handle progressively less of the Nation's commerce, they must do one of two things: (a) reduce the railroad operating costs and charges, or (b) continually increase rates on the gradually diminishing traffic that still remains to them. This is such a simple axiom, no argument is necessary to support it."[11]

Commissioner Miller contested the claim that competition among the 825 railroad operating companies[12]

[8] This total consisted of $215,462,825 for savings in operating expenses and $3,262,500 for reduced taxes. Another estimate, which was considered to be less reliable, amounting to $288,858,715, was based on 1929 conditions. Federal Coordinator of Transportation, *First Report, Regulation of Railroads,* 73d Cong., 2d sess., S. Doc. 119, January 1934, appendix IV, p. 106.

[9] Referring to the estimate of the railroad advisory committees which cooperated with Mr. Poland in reviewing the Prince plan, Mr. Eastman said: "It seems clear—and this is the judgment of Mr. Poland that their estimate of attainable economies errs, if at all, on the conservative side, i. e., in being low. This is particularly true of the terminal economies which were not fully studied." Same, p. 26.

[10] Almost half a century ago Collis Huntington, former president of the Southern Pacific, said: "While the uniting of small roads has been productive of great benefits to the owners and to the public who use them, yet I am satisfied that the best results may not be reached until substantially all the transportation business of this country is done by one company. The accomplishment of this would reduce the cost of transportation to the minimum which would admit of the lowest possible rates to shippers and passengers." Quoted in Miller, Carroll, *A Suggested Plan for the Solution of the Railroad Problem,* 1938, 27 mimeographed pages, p. 25. See also Hines, Walker D., Director-General of Railroads, *Report to the President for 1¼ months ended March 1, 1920,* p. 38, and *Report of the National Transportation Committee,* New York, February 13, 1933, p. 4.

[11] Miller, Carroll (with the collaboration of Commissioner, M. M. Caskie), *A Suggested Plan for the Solution of the Railroad Problem,* 1938, 27 mimeographed pages. See also the supplementary memorandum: Miller, Carroll, *Consolidation of the Rail Transportation Facilities of the United States into a Single System for Ownership and Operation under Private Management,* March 31, 1938, 21 mimeographed pages.

[12] This total of 825 is the number of operating line-haul and switching and terminal steam railway common-carrier companies accounted for in the Statistics of Railways for 1939. Including nonoperating lessor and proprietary companies, there were 1,365 railroad corporations, exclusive of industrial carriers, in the United States at the end of 1939.

results in lower transportation charges, and argued instead that "if the railroads were unified and competition among them eliminated, transportation costs would be reduced to such an extent that much lower rates would prevail than those necessary to sustain the higher costs resulting from a duplication of facilities of the numerous companies and the expensive competition among them which inevitably results." Under a single system, he asserted it would be possible to effect all of the economy measures which have been urged upon the railroads by various investigators, and the result would be "a reduction of at least one-fifth of the total expenses, representing possibly from 3 percent to 4 percent on the $19,000,000,000 outstanding railroad securities. They might even reach a total of $1,000,000,000 per annum." In a later statement, he again referred to economies under a single unified system of operation, and suggested $500,000,000 as a conservative estimate of the annual savings.[13]

Commissioner Miller expressed the opinion that "consolidation is the only ultimate solution of the railroad problem and of the broader transportation problem, insofar as these problems can ever be finally solved." He pointed out that a "single system would automatically bring about that very coordination now sought to be effected by the cooperation of independent railways through unified terminal operations, joint utilization of repair shops and facilities, the pooling of freight cars, passenger cars, and other rolling stock and equipment, the pooling of freight and passenger traffic, the unified handling of l. c. l. freight and the like." With a single unified system, he explained, many of the complexities of the existing rail rate structure and the multiplicity of routes which are attributable to competition for traffic could be eliminated, and it would be much easier to apply a cost basis in making rates. It was further contended that a single system would be generally more satisfactory and would avoid some of the difficulties and shortcomings involved in any multisystem plan of consolidation. The savings under a single system would be greater, and the stubborn problem of allocating carriers to different systems would be avoided. He also contended that "anything short of a complete grouping would leave open the gates for domination by financial interests, competitive practices, unprofitable solicitation, inequitable divisions," and other undesirable circumstances and practices. "If the railroads are not consolidated into one system or at least a few noncompetitive systems, under private ownership," Commissioner Miller concluded, "it looks as though they are headed for consolidation into one system, under Government ownership."

He recognized that there would be serious practical difficulties incident to the treatment of security holders of the various railroads and the protection against undue hardship of workers, communities, and other groups. As for the effects on railroad workers, Commissioner Miller recognized that a large part of the savings from consolidation would be at the expense of railway workers. But of this expected result, which has been one of the principal obstacles to both consolidation and coordination, he said:

> In answer to objections made on this score, I believe it will be to the decided welfare of the country for the Federal Government to take care of the displaced labor even on a full-pay basis. It seems to me that the cost to the Government would not be large because, in the aggregate, the number of men required for deferred maintenance work and construction might exceed the number displaced in the operating departments. Although some of the men displaced may not be fitted for certain classes of other work to be performed, the labor turn-over should soon absorb this class. With the advent of better business conditions and the recovery of traffic lost to other means of transportation, employment by the unified system of railways should soon exceed that of 1936 for all the railroads.

Weighing the advantages and disadvantages of a complete consolidation of the railroads, it may be said that opportunities for economy probably would be maximized and conflicts of interest minimized under a single consolidated system. In further support of a unified system and service, it may be noted that railroad service and operation are in a special sense of national concern and national scope. Interrelationships throughout the railroad network are inescapable under any system of organization, for the railroads must function as a unit in important respects if they are to give satisfactory service at low cost. But while this need for functional unity is recognized in many features of existing methods of handling traffic, it may fairly be said that the present organization of the railroads is not entirely conducive to the smooth unified performance of the railroad function as an important cog in the national economy. The industry strives to

[13] "The par value of the railroad securities now outstanding eligible to be exchanged for securities in the national system appears to be something less than $20,000,000,000. Net operating income for all steam railways for 1936 was $721,000,000 and for 1937, $635,000,000. While it was considerably less in 1938, it is hoped and expected that general business will soon be such that the railroads may again earn as much as in the 2 earlier years without any change in railroad organization. For this reason I have used the average net of the years 1936 and 1937 in the following calculations. This figure is $678,000,000, or 3.39 percent return on $20,000,000. The annual savings by unification into one system have been variously estimated at from $250,000,000 to $1,000,000,000. Assume that approximately $500,000,000 annually, which is considerably less than the average of these last two estimates, can be saved by consolidation into one system. If so, this saving would raise the average net operating income to $1,178,000,000. This would be equivalent to a return of 5.89 percent on $20,000,000,000, instead of 3.39 percent, the average of 1936 and 1937." Miller, Carroll, *Government and the Business of Transportation*, a paper delivered before the Ninth Annual Economics Conference for Engineers at the Stevens Engineering Camp, Johnsonburg, N. J., June 24–July 3, 1939, 20 mimeographed pages, p. 17.

function as a system, with only partial success because of an institutional and operating structure which restrains the fully effective fusion of the parts. Cooperation and competition, which are antagonistic precepts, are now in double harness.

On the other hand, there is the question whether an organization on such a scale as a single system would entail could be managed so as to realize potential savings without encountering offsetting diseconomies incident to great size and the unwieldiness of a farflung organization. In regard to this objection, Commissioner Miller has suggested that the administration of the proposed system could be regionalized and otherwise decentralized to the extent necessary for efficiency. Some also will object to the elimination of railroad competition and to the great concentration of economic power which would inhere in a completely consolidated railway system. Finally, the difficulties in carrying out so revolutionary a change and the hardships which would be visited upon various economic groups, even though temporarily, cannot be lightly dismissed.

In a somewhat different category than the comprehensive plans for the consolidation of all the railroads into a limited number of systems are the combinations of particular roads which have been effected or proposed by the various carriers. In the period 1920–40, applications involving approximately 94,000 miles of railroad came before the Interstate Commerce Commission for authorization of the acquisition of control of one carrier by another. But few, if any, outright or technical consolidations which involved previously independent roads and which can be regarded as of major importance occurred from the time of the Nickel Plate unification [14] in 1923 until the Gulf, Mobile, and Ohio was created in 1940 by the merger of the Mobile and Ohio and the Gulf, Mobile, and Northern.[15] This is aside from the merger of properties which previously had been affiliated in some kind of system relationship through looser types of combination, as with the New York Central and Southern Pacific systems.[16] Purchases of stock and leases or both have been much more common among the railroads, with varying results as to the degree of actual unification and of operating relationship accomplished thereby.[17] Other important interrailroad affiliations were established prior to 1933, without the approval of the Interstate Commerce Commission, principally through the medium of unregulated holding companies.

In support of certain of the applications made to the Interstate Commerce Commission, the carriers have offered estimates of the economies in operation which were expected to result from the unifications proposed. A recent study of these cases disclosed a rather wide variation in the ratio of estimated economies to the total expenses of the roads involved. On the whole, the anticipated reduction of expenses was rather small. A selected group of applications to combine carriers of approximately equal size showed average estimated savings amounting to 4.89 percent of the operating expenses for 1937.[18] Applying this percentage to the carriers as a whole, a saving of 4.89 percent of the operating expenses for 1937 of all classes of steam railroads would have been about $158,000,000. This figure is considerably lower then the estimates which have been made by various persons of the economies which would result from the consolidation of the railroads according to some comprehensive plan.

Although it is significant that the carriers have found it possible to assert, frequently in specific terms and in considerable detail, that substantial economies may be expected to result from the unification of railroad properties and operations, these estimates are of very limited value as a basis for general conclusions either as to the optimum size of railroad systems or as to the aggregate savings which might be realized from a complete program of railroad consolidation.

These carrier estimates have been made at different times, by various persons and with reference to varying conditions as to methods of operation, characteristics of traffic, and the physical layout of facilities. Moreover, economy does not appear to have been the principal aim of carriers in proposing unifications. Even when the matter of economy has been stressed, it seems to have been primarily with the intent of furthering other

[14] This consolidation was effected under State laws and regulatory commissions, and was approved by a majority of the Interstate Commerce Commission under secs. 1 (18) and 20a. See Operation of Lines and Issue of Capital Stock by the New York, Chicago and St. Louis Railroad Company, 79 I. C. C. 581.

[15] Gulf, Mobile and Northern and Mobile and Ohio Merger, 236 I. C. C. 61 (1939). The merger of the Louisiana, Arkansas & Texas into the Louisiana & Arkansas Railway Company was approved in 230 I. C. C. 181 (1938).

[16] With the approval of the Interstate Commerce Commission, eight controlled and operated companies were merged on June 30, 1938, into The Cleveland, Cincinnati, Chicago and St. Louis Railway Company. The latter company is a lessor in the New York Central system. (See 228 I. C. C. 240.) Effective June 30, 1934, 14 Southern Pacific system subsidiary companies operating in Texas and Louisiana were consolidated into the Texas and New Orleans Railroad Company, which is controlled by the Southern Pacific Company. (See 199 I. C. C. 47.) In certain other instances, notably of the Missouri Pacific and the Rock Island, proposed system unifications have not been consummated, apparently because of unwillingness of the carriers to accept conditions stipulated by the Commission. (See 166 I. C. C. 154, *in re* the Missouri Pacific; and 193 I. C. C. 395, 221 I. C. C. 611, *in re* the Rock Island.) A proposed consolidation of The Chicago, Rock Island and Pacific Railway, the St. Louis-San Francisco Railway Company, and the Chicago and Eastern Illinois Railway Company was rejected as impracticable by the Commission in 1935. (See 212 I. C. C. 89.)

[17] A list of authorizations for acquisition of one carrier by another is contained in appendix F of the Annual Reports of the Interstate Commerce Commission.

[18] Behling, B. N., *Railroad Coordination and Consolidation—A Review of Estimated Economies.* Prepared in the Bureau of Statistics, Interstate Commerce Commission, Statement, No. 4023, pp. 165 f.

objectives, such as accessibility to traffic, the preservation or establishment of advantageous routes and interchange arrangements, and the acquisition of lines that would contribute in one way or another to the financial strength of the applicants. This has meant, naturally, that savings have been measured rather narrowly, with consideration for the interests of the applicants and without particular regard to how other carriers or the rail transportation system as a whole might be affected. Another consequence of the fact that economy claims have been offered as an auxiliary and comparatively incidental argument is that the various estimates may not cover all of the opportunities for economy. In fact, some of these estimates have been accompanied by statements to the effect that only certain types of savings were included, and other possible economies have been given only general mention.

Even aside from limitations of the kind described above, no certain conclusions can be drawn from the fact that the estimated reductions of operating expenses submitted by carriers in their applications for unifications are smaller on the average than the economy figures suggested by those who favor sweeping plans for the rationalization of the railroad system. Whether this means that the carriers' estimates are too low or that the savings claimed for comprehensive consolidation are exaggerated is not revealed by such comparisons. It is reasonable to suppose that any series of unifications limited to two or three roads would give different results as to savings than would a systematic and much more comprehensive consolidation of all carriers according to some regional plan or into a single national system. The opportunities for economy in facilities, in organization, and in operations would be greater in the latter cases, and the actual net savings should be larger also unless inefficiencies of enlarged systems should be so serious as to appreciably increase costs.

It has been noted previously that the Federal Coordinator of Transportation and his staff, as required by the Emergency Railroad Transportation Act of 1933, in the period 1933–36 conducted numerous and detailed investigations of "unnecessary duplication of facilities of whatever nature" and of "other wastes and preventable expense" in railroad operation;[19] made suggestions for their elimination; and in some instances estimated the savings which might be effected if the recommendations were adopted.

The studies covered the coordination of railroad operations with those of other types of transportation, particularly by highway, as well as opportunities for cooperation among the rail carriers. Among the many possibilities for economy which were explored were included the unified operation of terminal facilities; the pooling of freight cars; the unified handling of merchandise traffic, including less-than-carload freight, freight-forwarder operations, and express; the modernization and joint use of repair facilities; various other possibilities for the pooling of freight and of passenger traffic and for joint action and use of facilities; the use of freight containers interchangeable among railroads and with highway operators; cooperation in research, in the disposition of scrap, and in the standardization, purchase, and handling of materials and supplies; and improvements in and centralization of interline accounting and settlements and of fiscal work.

In certain of these studies the recommendations were accompanied by appraisals of the amounts that might be saved annually. It was concluded, for example, that $100,000,000 a year might be saved from the pooling of freight cars;[20] at least $50,000,000 by the unification of freight terminal facilities;[21] $100,000,000 from the integration of merchandise traffic;[22] and $100,000,000 or more by various changes in passenger service.[23] In addition to those mentioned here, several other estimates of potential economies from coordinaion were submitted by the Coordinator.[24] All of these estimates were offered only as tentative judgments of what the Coordinator and his aides concluded, on the basis of data assembled and analyzed by them, the reasonable potentialities to be. The specific amounts were not regarded as final judgments, however, and strict accuracy of the figures was not claimed. The estimates were based for the most part on data pertaining to operations in 1932 and 1933, both subnormal years.

For still other coordination proposals, no specific estimates of the probable savings were submitted.[25] Hence, no figure representing the aggregate economies

[19] Emergency Railroad Transportation Act, 1933, title I, section 4.

[20] Federal Coordinator of Transportation, *Report on Freight Car Pooling*, 1934, pp. 3, 35.

[21] Federal Coordinator of Transportation, *Second Report on Economy Posibilities of Regional Coordination Projects*, 1935, p. 2.

[22] Federal Coordinator of Transportation, *Merchandise Traffic Report*, 1934, pp. 1, 316.

[23] Federal Coordinator of Transportation, *Passenger Traffic Report*, 1935, pp. 59, 82–87.

[24] Because of its magnitude, one other estimate of the Federal Coordinator and his staff should be noted. It was found that a thorough modernization, relocation in accordance with existing needs, and subsequent joint use of major facilities for repair, accompanied by greater standardization of equipment, might eventually yield savings of as much as $366,000,000 per annum. Because of the scope of the changes required, such a large saving was not regarded as attainable except over a considerable period, but was considered to be a long-range objective. *Report on Consolidation or Joint Use of Railroad Major Shops and Modernization of Repair Shop Facilities*, 1936, pp. 53–55.

[25] Since all such estimates are inevitably questionable, the several early estimates submitted by the Federal Coordinator's staff became the center of attention and criticism. Realizing that consideration of the fundamental issues involved in the proposals was more important than fruitless debate as to the exact amount of potential economies, Mr. Eastman instructed his staff to discontinue the making of comprehensive estimates.

anticipated from the adoption of all the suggested coordinations was presented by the Federal Coordinator. But his findings and recommendations indicate that the potential over-all savings from coordination in the various possible directions probably compare favorably with the savings anticipated by those who have advocated the consolidation of the railroads according to some comprehensive plan. In fact, a single unified system would be the only type of consolidation which would make directly available all opportunities for the coordination of railroad facilities and operations. It may be that a combination of consolidation and coordination would give the best results, with respect to economy as well as other considerations.[26] There has been no appreciable actual testing of the practicability of the Coordinator's proposals or of the economies anticipated therefrom, since his recommendations have not been adopted on any consequential scale, for the reasons noted below.

Obstacles and Objections to Consolidation and Coordination

Among the objections raised by those who are not convinced of the desirability, as a matter of principle and fundamental policy, of a far-reaching program for the consolidation and coordination of the railroads is that the weakening of railroad competition would tend to breed inertia. It is suggested also that greater concentration of power over the railroads resulting from consolidations into a few great systems might have undesirable results, while on the other hand competitive railroads as now constituted cannot, because of their competitive relationships, be expected to submerge their conflicting interests on many fronts in agreements for cooperative coordination. There is also the belief that the potential net economies have been exaggerated, a contention which is difficult to refute conclusively inasmuch as the magnitude of savings cannot be predicted with certainty. Those who hold these views naturally favor gradual change rather than a sweeping program or master plan for the reorganization of railroad facilities and operating methods.

In addition, opposition by various groups who fear the consequences of a broad program of railroad rationalization with respect to their own welfare constitute a formidable barrier to unification. Neither railroad managements nor workers have shown much enthusiasm for a drastic reorganization of railroad facilities and operating practices. The executives are influenced largely by regard for their respective companies and seemingly for their own positions in them, an attitude which is not unnatural but which does not make for an atmosphere of cooperation and compromise or for a broad view of the possibilities for improving the railroad system of the Nation. Railway employees are disturbed by the belief that whatever savings might be achieved would be largely through a reduction of employment opportunities. Spokesmen for labor also have expressed doubts that the economies would be very great. As to the latter question, it may be pointed out that should savings prove to be disappointing, the displacement of workers would also be correspondingly limited, if the widely held opinion is correct that the largest part of the savings would result from economy of labor. Moreover, the fear that employment would be diminished fails to take account of the objective of railroad consolidation and coordination, as pointed out by Commissioners Splawn, Eastman, and Mahaffie in their report to the President in March 1938:

> With respect to the argument that consolidation and coordination would add to unemployment, we believe that the situation and the choice are not so simple as this argument would suggest. If all means are used to decrease the cost of railroad operations, the chances for a railroad service that will thrive and grow and be capable of adding to employment will be vastly improved. Under conditions as they now exist, the prospects point to the continuation of a shrinking railroad service. Consolidation and coordination will, therefore, pave the way to better rather than worse unemployment conditions, and the 1936 agreement will afford a protection against hardships from the process of change such as labor enjoys in no other industry and such as the Government does not even extend to its own employees * * *.[27]

It was with the intention to safeguard the interests of railroad workers that section 7b of the Emergency Railroad Transportation Act of 1933 provided that the

[26] Commissioners Splawn, Eastman, and Mahaffie leaned toward this conclusion in their recommendations to the President, as reported in *Immediate Relief for the Railroads,* House Doc. No. 583, 75th Cong., 3d sess., 1938, p. 37. Their statement bearing on this point was:

"It is, we think, very generally agreed that there is a large amount of waste in the railroad industry of the character above described. There are those, however, both in and out of the industry, who do not believe that it is practicable to eliminate this waste by coordinations under present conditions. The number of independent managements is, they feel, too large for effective negotiations and agreements. They would accomplish the objectives, therefore, primarily by consolidations, to be followed by coordinations after the number of separate companies has been reduced.

"Theoretically, the maximum opportunity for eliminating the present waste would be created by unification of all railroads into a single system; and the next best opportunity, by combining them into a very few systems. Practically, the difficulties of unification into a single system would be very great. It could only be accomplished by a use of the power of eminent domain on a huge scale, and would require much the same legal procedure as Government acquisition of the properties. The effective and efficient administration of such a system would require a new and wholly untried plan of organization. Public opinion would not, we believe, support such a system. Much of the same difficulties and objections would attach to the creation of a few great systems, and in addition such a plan would preserve railroad competition at certain centers of population but eliminate it at many others. There is well-founded opinion to the effect that smaller railroad companies permit of more intensive and efficient management. We incline to the belief that the best practicable results can be secured by a limited amount of consolidation, coupled with broad development of cooperative coordination."

[27] *Immediate Relief for the Railroads,* H. Doc. 583, 75th Cong., 3d sess., 1938, p. 38.

number of employees in the service of a carrier might not be reduced below a specified number and that no employee might be deprived of employment or be put in a worse position with respect to compensation as a result of coordination.[28] Later, the so-called Washington agreement of 1936 between rail managements and labor organizations provided for dismissal compensation to workers displaced by reason of unification projects. With similar intent, the Transportation Act of 1940 affords protection to workers who might be adversely affected by railroad unifications.[29]

Under the most favorable circumstances, there likely would be some displacement of particular workers as a result of consolidations and coordinations, even though total employment opportunities ultimately might increase with subsequent improvement in the position of the railroads. For this reason, it has been felt that the railroads should at least pay reasonable dismissal compensation to such victims. Whatever position is taken as to the economic merits of or the moral obligation to pay dismissal compensation to displaced workers generally, a realistic view of the railroad situation probably must recognize the practical necessity of such payments if railroad coordinations and consolidations which are considered to be in the public interest are to be accomplished.[30] Since such payments would be a declining and temporary burden, dismissal compensation might properly be regarded as a revenue-saving outlay assumed in the initial stages in order to gain expected later savings.

The first unification case to come before the Interstate Commerce Commission since the passage of the Transportation Act of 1940 indicates that section 5 (2) (f), the so-called Harrington amendment, may become an important deterrent to railroad unifications intended to achieve economies. On July 31, 1940, Division 4 approved a proposed lease by the Colorado and Southern Railway Company of the properties owned and operated by the Fort Worth and Denver City Railway Company and the Wichita Valley Railway Company.[31] The latter roads now are controlled by the Colorado and Southern through stock ownership, and all are included in the Burlington System. Subsequent to further hearing and reargument before the entire Commission, which followed the enactment of the 1940 act, the application of the Colorado and Southern was denied on June 9, 1941.[32] The decision of the majority stressed the uncertainty of the estimated savings[33] and their insignificance during the first 4 years because of the protection to labor required by the aforementioned Harrington amendment.[34] It was further stated that "we are now specifically required to give consideration to the interest of such employees in determining whether the transaction is consistent with the public interest. Under the proposed lease the future of any individual employee of lessor would be uncertain." Referring in a dissenting expression to the readjustments imposed on railroad labor in the event of displacement, Chairman Eastman, joined by Commissioners Mahaffie and Miller, said: "Assuming for the moment that these statements (of the majority) are correct, it is clear that they would be equally true of any unification involving labor economies. Therefore, if they are sound reasons for disapproving the transaction here proposed, they would be an equally sound reason for disapproving

[28] Section 7b of the act of 1933 reads as follows: "The number of employees in the service of a carrier shall not be reduced by reason of any action taken pursuant to the authority of this title below the number as shown by the pay rolls of employees in service during the month of May 1933, after deducting the number who have been removed from the pay rolls after the effective date of this act by reason of death, normal retirements, or resignation, but not more in any 1 year than 5 per centum of said number in service during May 1933; nor shall any employee in such service be deprived of employment such as he had during said month of May or be in a worse position with respect to his compensation for such employment, by reason of any action taken pursuant to the authority conferred by this title."

[29] Section 5 (2) (f), as amended, reads: "As a condition of its approval, under this paragraph (2), of any transaction involving a carrier or carriers by railroad subject to the provisions of this part, the Commission shall require a fair and equitable arrangement to protect the interests of the railroad employees affected. In its order of approval the Commission shall include terms and conditions providing that during the period of 4 years from the effective date of such order such transactions will not result in employees of the carrier or carriers by railroad affected by such order being in a worse position with respect to their employment, except that the protection afforded to any employee pursuant to this sentence shall not be required to continue for a longer period, following the effective date of such order, than the period during which such employee was in the employ of such carrier or carriers prior to the effective date of such order. Notwithstanding any other provisions of this act, an agreement pertaining to the protection of the interests of said employees may hereafter be entered into by any carrier or carriers by railroad and the duly authorized representative or representatives of its or their employees."

[30] In a decision rendered on December 4, 1939, the Supreme Court of the United States upheld the power of the Interstate Commerce Commission, as a matter of public interest and in furtherance of a national policy of railroad consolidation, to prescribe reasonable protection and dismissal compensation to employees displaced or transferred because of railroad unifications, as a condition to its approval of such transactions. The Court noted that in the instant case, involving the lease of the properties of the Chicago, Rock Island & Gulf Company to the Chicago, Rock Island & Pacific Railway Company, "the maximum cost of compliance with the conditions, it was found, would be $290,000 spread over a period of five years, during which the savings effected by the lease would be not less than $500,000." The *United States of America and the Interstate Commerce Commission* v. *Lowden, et al.*, 308 U. S. 225.

[31] Fort Worth and Denver City Railway Company et al., Lease, Etc., 240 I. C. C. 637.

[32] 247 I. C. C. 119.

[33] The applicant estimated the savings at $307,942, but some of the items were questioned.

[34] Commissioner Aitchison, who had approved the lease in the Division report, voted with the majority in the later decision of the full Commission, and said: "It seems to me that under the law as it now stands, before we can find consistency with the public interest, based upon saving in cost of operation, we must have a clear case either of realizable economies not affected by the Harrington amendment, or of economies of such amount and importance that, having regard for the interest of the carrier employees affected, the transaction should be carried out despite the delay in full realization which the Harrington amendment makes necessary. This is not a strong, clear case, and the economies indicated are not so material and certain that they warrant the findings now required by section 5 (2) of the amended act. I therefore now vote to deny the application."

any unification which contemplated the 'avoidance of waste' which the Supreme Court termed a 'primary aim' of the railroad policy of Congress as it then existed." Continuing, he observed:

It is true that the provisions of section 5 with respect to unifications have since been amended by the Transportation Act of 1940, but under the amended section the test of any such transaction remains the general public interest, upon which the Supreme Court predicated its decision. In considering the public interest, we are directed by paragraph (2) (c) to consider, among other things, the "interest of the carrier employees affected," but in paragraph (2) (f) the terms of a "fair and equitable arrangement to protect the interests of the railroad employees affected" are specified. Obviously if, with respect to railroad employees, such an arrangement is made a condition of our approval of a proposed transaction, the intent of Congress is satisfied. Congress clearly did not intend to preclude such a transaction on the broad ground that under it the "future of any individual employee * * * would be uncertain."

Representatives of both railroad executives and workers have regarded consolidation more favorably than coordination. Their viewpoint is effectively summarized as follows in the report made to President Roosevelt by the so-called Committee of Six:

* * * * *

Such investigations as have been made disclose some possibilities of operating economies through particular coordinations, but the practical aspects of the problem presented in most cases have offered obstacles of such magnitude as to make the projects infeasible.

* * * * *

The fundamental difficulty in connection with most coordination projects that have been suggested is that they would involve virtual consolidation of facilities or equipment of competing carriers while leaving the owners thereof still in competition, or involve consolidations of highly competitive traffic without eliminating the reasons for competition. It is easy to understand the resistance of a railroad to a project which involves giving up to one or more of its competitors the use of terminals or other facilities which it has acquired and developed through pioneer effort, foresight, initiative, and the expenditure of vast sums of money and the continued exclusive use of which it regards as essential to its future well being. We know of no method by which a railroad could be properly compensated for a surrender of its position in such a case.

Consolidation, on the other hand, need mean no (such) surrender * * *, but contemplates a blending of the separate units into the consolidated company on an equitable basis which gives full and proper recognition to all attributes and contributions of each.

Furthermore, the coordination of railway terminals requires the organization of joint agencies or new corporate entities and separate operating organizations, involving in many instances the expenditure of large sums for physical improvements with resulting increase in fixed charges. Additional expenses inherent in these separate terminal organizations operate to offset or absorb apparent economies. The expeditious movement of traffic is obstructed by the division of supervision and authority consequently created, with resulting increase in expenses. Also effective competition by a railroad with other modes of transportation is to a large extent dependent on service, and much of the advantage of the railroad in this connection lies in its ability to handle its own traffic through terminals.

While there have been suggestions of economies in operation through the pooling of traffic, the resulting adverse effect on communities that would be deprived of adequate transportation service and the substantial elimination of competition and service reduce to a great extent the possibilities in this direction.

* * * Coordination and pooling constitute a field clearly belonging to railway management and should not be made a governmental function. To the extent that improvements in service and economies of operation can be obtained through unification of operations it should wherever possible be accomplished through consolidation * * * .

None of these projects should be undertaken without a clear demonstration of real economic advantage and a full consideration of the rights and interests and fair and equitable protection of the employees.[35]

Because of anticipated results unfavorable to them, other groups also object to far-reaching proposals for railroad unification. Some communities protest the threatened elimination of competitive rail service or the removal of yards, shops, offices, and the like, notwithstanding that many of these same communities in recent years have felt the consequences of a decline in railroad traffic, revenues, and expenditures as well as the curtailment of rail service because of traffic diversions to competing forms of transportation, a trend which might be more effectively resisted with improved and more economical organization of railroad facilities. Some shippers also are unwilling to be deprived of what they believe to be the advantages of competitive rail service. Taxing jurisdictions foresee the reduction of tax revenues if certain facilities should be abandoned or reduced in importance and value as a result of consolidation or coordination, although railroad unifications in many cases, especially in the larger communities, would release valuable real estate for other useful purposes. The reluctance of security holders to accept changes in their status which might result from unification, joint use, and possible abandonment of railroad properties constitutes another obstacle. It has also been suggested that unification projects should be deferred until the traffic, revenues, and financial condition of the carriers improve, when, it is thought, changes could be effected with less disturbance and hardship.

Whether these views as described are regarded as

[35] Report of Committee appointed September 20, 1938, by the President of the United States to submit recommendations upon the general transportation situation, December 23, 1938, p. 29. M. W. Clement, Carl R. Gray, and E. E. Norris represented the railroad executives on this Committee, and the representatives of labor were G. M. Harrison, B. M. Jewell, and D. B. Robertson.

For an expression similar to the one quoted above, see the testimony of G. M. Harrison, Chairman, Railway Labor Executives Association at the hearings on the Omnibus Transportation Bill, H. R. 2531, 76th Cong., 1st sess., 1939, pt. 2, pp. 212–216.

short-sighted or not, it is at least evident that they are very real obstacles to large-scale unifications of railroads and to their cooperation in effecting arrangements for coordination. Some of the objections illustrate the prevalent tendency of individuals and groups to be concerned primarily with the immediate consequences of events and policies and to overlook or underestimate the probable results over the longer term. The acceptance of short-term burdens in favor of greater but more remote gains is seldom an easy choice, especially if there are doubts as to whether the gains will ultimately be realized. The difficulties in this respect are increased by the fact that the present hardships and the possible future benefits, as in the case of all economic change, would not be divided equally among individuals and groups. Nevertheless, the failure of a railroad system, faced with strong competitive pressure, to promote the most economical and efficient organization that is practicable, because of an unwillingness to bear the unavoidable sacrifices entailed, may result in further curtailment of rail traffic, earnings, and employment. Referring to this in its 53d Annual Report to Congress dated November 1, 1939 (p. 15), the Interstate Commerce Commission said:

> In dealing with the transportation problem one objective, so far as the Government is concerned, must surely be to achieve for the country the most efficient and economical system of transportation. In the end, also, we believe that the pursuit of that objective will do most to protect the interests of those who have carrier investments, for reasons which were thus stated in our last annual report:
>
> "They make a serious mistake who regard the elimination of the wastes which are now inherent in the present railroad setup and in the relations of all the agencies of transportation as a mere means of cheese-paring economy and depriving more men of work. Transportation success can never be the product of high rates and restricted service. As the makers of low-priced automotive vehicles fully demonstrated, there is no fixed amount of transportation to be performed, but rather an amount capable of indefinite expansion, provided the public can be offered sufficiently attractive service at a price which it is able to pay. Consolidation, coordination, and the better adjustment of competitive conditions will reduce transportation costs, but they can also open the door to the better service and lower prices which will create new business and employment."
>
> No constructive action in connection with the transportation problem is more important, in our judgment, than such efforts to reduce the great amount of preventable and uneconomic waste which now exists in transportation and to accomplish a sound integration of the various modes of transportation. It calls, also, for aggressive leadership on the part of the Government, as has been proved by experience not only in this country but in others as well, and this leadership must be implemented with certain reserve powers which can be used, under appropriate conditions and as occasion may require, to bring recalcitrants and stragglers into line.

Consideration of the duplications and competitive wastes in the existing organization and operation of the railroads lends force to the contention that substantial economies might be realized by consolidation or coordination or by a combination of both methods. The possibility of estimating very accurately the net savings, however, is not good, particularly in view of the unknown extent to which the potential gross savings, whatever their aggregate amount, might be reduced by inefficiencies in the administration of enlarged systems or by the costs of instrumentalities required to implement agreements for cooperative coordination among competitive railroad systems. This uncertainty, combined with the aforementioned objections of those who are concerned with the consequences to them of the projected changes, has prevented and seemingly will continue to prevent the voluntary adoption of comprehensive proposals for railroad unification. The fact is that there has not developed to date public support sufficiently strong, or at least well enough organized, to overcome the various misgivings and objections that exist with respect to consolidation and coordination on a major scale.

From time to time, it has been suggested by various persons and groups that legislation to compel unification may be necessary, and some have urged that this be done. Certainly events over the past two decades and more strongly indicate that some measure of compulsion will have to be exercised if unification on a large scale is to be carried out. In the absence of a strong and concerted public opinion favorable to such a course, it is understandable that Congress has failed thus far to adopt such drastic measures. In regard to enforced consolidation, the Committee of Six, previously referred to, thought that the country is not "ready for any compulsory system of consolidations. Whether ultimate resort must be had to the principle of compulsion is a question which we think it better to defer until after there has been an opportunity to see what can be accomplished if the railroads are relieved from these limitations and restrictions." This group of railroad executives and labor leaders also was of the opinion that "the best results will be achieved by leaving all initiative in the matter to the railroads themselves."[36] It was contemplated that the approval of a Transportation Board, the creation of which was proposed, should be required for any consolidation to be made effective. The restrictions mentioned in this report referred especially to the mandate for a complete plan of consolidation, which has since been eliminated by the Transportation Act of 1940. It remains to be seen whether the removal of this limitation will be productive of results.

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[36] Report of Committee appointed September 20, 1938, by the President of the United States to submit recommendations upon the general transportation situation, December 23, 1938, p. 31.

PART I—SECTION V
RAILWAY FINANCING, 1890–1940

By W. H. S. Stevens*

The Collapse of Railway Security Values and Its Causes

Losses in Market Value of Railway Securities

The depression of the 1930's dealt a severe blow to large numbers of rail investors in the United States. Not only were railroad securities widely distributed, but the 10 or more billion dollars of railway bonds constituted the backbone of the investment holdings of thousands of trust estates, investment, fiduciary, educational, and eleemosynary institutions. Prices of rail issues, particularly stocks, fell precipitately, and the losses, unrealized and realized, ran into the billions. Also, a large number of railway companies found themselves unable to meet their interest charges and fell into the hands of receivers and trustees.

Data regarding the actual losses of investors in American railways over the last decade are not, of course, available. Moreover, conclusions regarding the total realized and unrealized losses resulting from declines in the market prices must be based upon estimates. If the securities of United States railroads listed on the New York Stock Exchange be used as an indicator of the trend in prices of all domestic railway securities,[1] the average market value of bonds was highest in 1928, at $95.97 per $100 face value, whereas stocks reached their peak in 1929 at $133.71 per share, after adjusting all shares to a $100 par basis.[2] The average value of listed bonds declined to $92 in 1929, but stocks made an advance of more than $10 per share over the 1928 average. The net result was that the market value of stocks and bonds combined was higher in 1929 than in 1928.

On the basis of these average prices, the market value of line-haul railway stocks outstanding in the hands of the public at the end of 1929 is estimated at $9,645,000,000 and the corresponding bond values as of the same date at $10,629,000,000, making a total of $20,274,000,000.[3]

Also on the basis of the New York Stock Exchange prices on the first day of each month, the average market value per share of railway stock, adjusted to $100 par value, touched bottom in 1932 at $28.73, but the low for railroad bonds did not occur until 1938 at $56.52. Combining stocks and bonds, the lowest total market value of railway securities was reached in the latter year. By this method of computation the market value of the securities of line-haul railway companies not held by railways declined from a peak of $20,274,000,000 in 1929 to a low of $8,657,000,000 in 1938, a drop of $11,617,000,000 or 57.3 percent. If, however, we assume that the total volume of railway securities outstanding in 1938 was the same as in 1929, the decline would be from $20,274,000,000 in 1929 to $9,243,000,000 or 54.4 percent.

Table 1 shows the estimated market values of the securities of line-haul railway companies from 1929 to 1939 upon each of the foregoing bases.

Investor Losses in Railroad Reorganizations

In terms of the combined capital stock and funded debt actually outstanding, 1938[4] was the peak year

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[1] Prices of U. S. railway issues listed on the New York Stock Exchange may be considered as representative of the prices of all railway issues. On January 1, 1929, the total par value of all domestic stocks, including the book value of four no par stock issues, listed on the Exchange amounted to $7,311,000,000. The face value of all domestic railway bonds listed on this date was $10,085,000,000. The total par value of both stocks and bonds listed was, therefore, $17,396,000,000. (Data obtained from files of the New York Stock Exchange.) The total par value of securities outstanding as of December 31, 1928, for all steam railways was $23,747,000,000. The former figure is 73 percent of the latter. This ratio has declined somewhat in recent years.

[2] Beginning with January 1, 1929, in the case of stocks and August 1, 1929, in the case of bonds, the New York Stock Exchange has published the number of shares and market value of stocks and the par and market value of bonds of United States railroads listed on the Exchange on the first day of each month. The corresponding figures for the first day of each month from January 1, 1928, to the above dates were obtained from the files of the Exchange. Using these stock figures, a yearly average price per share was computed by dividing the sum of the market values of all shares on the first day of each month by the sum of the number of shares listed on the same dates. The latter figures, as published, required some adjustments in order to express all shares in terms of $100 par units. This was done by reducing the number of shares of less than $100 par or no par, contained in the listings, to an equivalent number of shares of $100 par. For shares with a par value the equivalent number of shares would be the total par value of all shares listed divided by $100; for no par shares, the total book value of all shares listed divided by $100. A yearly average market value for bonds was obtained by dividing the sum of the market values on the first day of each month by the sum of the face values of all bonds listed on the same dates and multiplying the quotient by $100.

[3] The New York Stock Exchange listings include practically no equipment. Because of their safety, it has been assumed that prices of equipment obligations declined insignificantly during the depression. In the computations of market values, therefore, the Stock Exchange prices were applied to total railway funded debt, excluding equipments. The resulting totals were then added to the total face value of equipment obligations outstanding at the end of each year, no figures being available to separate the amounts of these held by railways from the grand total outstanding. However, it is generally understood that amounts held by railways, if any, are very small.

[4] As between 1938 and 1939, the peak point in receiverships and trusteeships depends upon the criterion used. In terms of the com-

TABLE 1.—*Estimated Market Value of Railway*[1] *Securities Not Held by Railways, 1929–39*[2]

A. MARKET VALUE OF STOCKS AND BONDS[3] OUTSTANDING AT END OF EACH YEAR[4]

Year ended	Stocks and bonds		Stocks		Bonds	
	Amount	Index 1929=100	Amount	Index 1929=100	Amount	Index 1929=100
	Millions		*Millions*		*Millions*	
1929	$20,274	100.0	$9,645	100.0	$10,629	100.0
1930	19,697	97.2	8,476	87.9	11,221	105.6
1931	15,412	76.0	5,200	53.9	10,212	96.1
1932	9,327	46.0	2,028	21.0	7,299	68.7
1933	10,274	50.7	2,743	28.4	7,531	70.9
1934	11,937	58.9	3,140	32.6	8,797	82.8
1935	11,203	55.3	2,767	28.7	8,436	79.4
1936	13,194	65.1	3,969	41.2	9,225	86.8
1937	12,973	64.0	3,979	41 3	8,994	84.6
1938	8,657	42.7	2,268	23.5	6,389	60.1
1939	8,725	43.0	2,457	25.5	6,268	59.0

B. MARKET VALUE EQUIVALENT OF STOCKS AND BONDS[3] OUTSTANDING AT THE END OF 1929[5]

1929	$20,274	100.0	$9,645	100.0	$10,629	100.0
1930	19,342	95.4	8,508	88.2	10,834	101.9
1931	15,194	74.9	5,274	54.7	9,920	93 3
1932	9,249	45.6	2,072	21.5	7,177	67.5
1933	10,299	50.8	2,757	28.6	7,542	71.0
1934	12,001	59.2	3,217	33.4	8,784	82.6
1935	11,502	56.7	2,851	29.6	8,651	81.4
1936	13,536	66.8	4,035	41.8	9,501	89.4
1937	13,318	65.7	4,060	42.1	9,258	87.1
1938	9,243	45.6	2,329	24.1	6,914	65.0
1939	9,480	46.8	2,535	26.3	6,945	65.3

[1] Line-haul companies only.
[2] Calculations and adjustments of N. Y. Stock Exchange and I. C. C. figures made by Sam G. Spal, I. C. C., Bureau of Statistics.
[3] Including equipment obligations at face value.
[4] Computed by applying the average of the N. Y. Stock Exchange railway stock and bond market values on the first day of each month to volume of stocks and bonds of all line-haul railways outstanding at the end of each year, as shown in the I. C. C., *Statistics of Railways in the United States*. For details see text and footnotes.
[5] N. Y Stock Exchange market values applied to railway stocks and bonds outstanding at the end of 1929. See note 4.

for receiverships and trusteeships in the depression of the 1930's. On December 31 of that year the total capitalization of the 109 line-haul steam railroads in the hands of receivers and trustees aggregated $5,238,085,691 or 23.86 percent of the $21,952,785,632 combined capital stock and unmatured funded debt of all line-haul steam railways in that year. These 109 line-haul roads owned 69,785 miles of line and operated 76,938 miles at the end of that year, or, respectively, 29.46 percent of the 236,842 miles[5] owned by all line-haul steam railways and 30.80 percent of the 249,826 miles[6] operated by all roads at the end of that year.

As of October 31, 1940, reorganization plans[7] for 25 of these roads with a total capitalization in excess of 4.6 billion called for a debt reduction aggregating in excess of 2 billion dollars (from $3,734,272,286 to $1,630,112,641). Of a total of nearly 1.5 billion of old par value preferred and common stock, less than 25 percent would receive any new securities under approved or proposed plans, and of over 2 million shares of old no par stock, roughly the same proportion.[8]

The Business and Financial Risk in Railroad Enterprises

The most important single factor in producing the foregoing conditions was a radical increase in the business risk in railroad enterprises resulting from the combination of a major business depression with the development of extensive and intensive competition in transportation.[9] Important contributory reasons were an unfortunate capitalization structure[10] and a rapidly mounting tax burden, the latter occurring chiefly in the last two or three decades.

Years ago Walter Hastings Lyon in his volume on *Capitalization* pointed out the fundamental and important distinction between "business" and "financial" risk. The former is the risk that the corporation may prove incapable of earning a sufficient amount to cover its operating expenses; the latter is the risk that the corporation may be unable to meet its interest charges because of a faulty capitalization.[11]

bined capital stock and matured and unmatured funded debt, the peak was in 1939 when the total capitalization of the 108 line-haul railways in the hands of receivers and trustees on December 31 aggregated $5,953,168,966. Excluding the funded debt matured (which is treated as a current liability in recent years), the capitalization of the 109 railways in the hands of receivers or trustees on December 31, 1938 ($5,238,085,691), was in excess of that of the corresponding 108 companies at the end of 1939 ($5,094,071,155). Similarly, the number of miles of line owned by the 109 line-haul railways in the hands of receivers and trustees on December 31, 1938 (69,785 miles), exceeded those owned by the corresponding 108 line-haul railroads on December 31, 1939 (69,361 miles). The mileage operated by the 109 railroads at the earlier date (76,938 miles), however, was less than that operated by the 108 roads at the later date (77,013 miles). Although total capital stock, unmatured funded debt, and matured funded debt figures are available for roads in receivership and trusteeship, only capital stock and funded debt unmatured are available for all roads in the United States. In computing the proportion of total capitalization in the hands of receivers and trustees, therefore, the 1938 base, which is highest for receivership and trusteeship roads on the basis of combined capital stock and unmatured funded debt, has been used. For the foregoing figures see "Steam Railways in the Hands of Receivers and Trustees on December 31, 1939, and Changes in the List of Companies Affected by Receivership or Trusteeship, to July 31, 1940," I. C. C. Bureau of Statistics, *Statement No. 4032, File 52–A–2*, August 1940 (mimeographed).

[5] Excluding Canadian, Hawaiian, and Alaskan mileage. Table 1, I. C. C., *Statistics of Railways in the United States, 1938*, p. S–3.
[6] Including Canadian and excluding Alaskan and Hawaiian mileage. *Ibid.*
[7] Approved by the Commission in 21 cases and proposed in 4.
[8] *Change in capitalization under plans of reorganization approved by the Commission, or proposed by examiners, for railroads in reorganization proceedings before the Commission*, Bureau of Finance, I. C. C., as of October 31, 1940 (mimeographed). This tabulation is shown in the *54th Annual Report of the Interstate Commerce Commission* (1940), pp. 64–66.
[9] "It is clear that railroad ills have been precipitated by an abrupt and continued decline in demand for railroad services unparalleled in severity and duration * * * The general industrial depression was the primary cause * * * but to the great depth of the fall another cause contributed heavily—the great increase in recent years in competition." *52nd Annual Report of the Interstate Commerce Commission*, 1938, p. 2.
[10] "The chief contributory factor to railroad distress * * * has been the great volume of indebtedness." *Ibid.*, p. 3.
[11] "Net income offers the first and immediately significant figure. Its amount and fluctuation, however, depend directly on the amount and range of fluctuation of gross income in relation to the amount and range of fluctuation of the percentage of the gross income used in operating expenses. We may call this the 'business risk,' because it depends on the nature of the business and the ability of the management. Though no financial plan can affect either, the business risk

The distinction between these classes of risks so far as railways are concerned was excellently illustrated by the tabulations presented by John E. Oldham at the hearings on railroad consolidation in 1926. In these tabulations 10 of the largest roads with satisfactory dividend records were designated as "strong" roads and indicated as Group A, and 10 of the largest roads without such records, as "weak" roads and indicated as Group B.[12]

These tables showed that the proportion of traffic which each group derived from passenger, freight, and miscellaneous service was approximately the same, as were also the proportions of tonnage derived from each of the major classes of freight traffic. (Tonnage statistics were for the fiscal year 1916; all other figures represented an annual average for the 3-year period ended with June 30, 1917.)

Percent of Gross Operating Income Obtained From Different Kinds of Traffic

	Freight	Passenger	Miscellaneous	Total
Group A	68.5	21.7	9.8	100
Group B	72.1	20.5	7.4	100

Classification of Tonnage

	Percent of total tonnage							
	Agriculture	Animals	Mines	Forests	Manufactures	Miscellaneous	LCL goods	Total
Group A	19.2	3.8	42.9	13.7	13.9	1.6	4.9	100
Group B	17.2	4.1	40.9	13.2	18.2	2.2	4.2	100

Ton-mile revenues and passenger-mile revenues also were approximately the same for both groups. Both expended about the same proportion of their gross operating income for operating expenses and taxes, excluding maintenance, and both had left about the same proportion of gross available for expenditures upon the property (represented by maintenance and surplus combined) and for fixed charges and dividends.

Rates[1]

	Rate[1] per ton mile	Rate[1] per passenger mile
Group A	$0.00812	$0.02060
Group B	.00819	.02060

[1] This is Mr. Oldham's term. Actually ton-mile and passenger-mile revenue.

Disposition of Gross Operating Income

	Received from passenger, freight, and miscellaneous traffic	Operating expenses and taxes, excluding maintenance	Available for expenditure upon property (maintenance and surplus combined)	Aggregate of fixed charges and dividends
	Percent	*Percent*	*Percent*	*Percent*
Group A	100	41.1	35.7	23.2
Group B	100	43.6	33.8	22.6

Percent of Gross Operating Income Distributed to Security Holders

	Percent of gross paid as fixed charges, interest, and rentals	Percent of gross paid as dividends on preferred and common stock	Total same as last column in above table
	Percent	*Percent*	*Percent*
Group A	11.5	11.7	23.2
Group B	22.2	.4	22.6

These figures, therefore, according to Mr. Oldham, offered little indication that on the average the roads of either group had any special advantage over each other in terms of location, traffic carried, rates, operating costs, or other significant operating conditions. The essential factor that made one group strong and the other weak was not the difference in the business but in the financial risk involved. The strong roads paid out only 11.5 percent of their gross operating income in the form of fixed charges, interest, and rentals whereas the weak roads expended 22.2 percent. The obligations, interest, and rentals of the strong roads, if capitalized at 5 percent, were equal to only $2.31 per dollar of gross operating income whereas those of the weak aggregated $4.44.

Moreover, although the figures for the strong and weak roads were averages, the variations for individual

Capitalization for Each $1 of Gross Operating Income

	Obligations—Rentals and interest capitalized at 5 percent	Preferred stock	Common stock	Total[1]
Group A	$2.31	$0.22	$1.54	$4.07
Group B	4.44	1.14	1.45	7.03

[1] "As railroad income is derived not only from traffic but also from outside investments, and as the proportion of income from the several sources varies with individual companies, for the sake of uniformity in the above comparisons the proportionate part of the capitalization which may be properly considered as representing railroad property has been determined by placing the same proportion of capitalization against the railroad property that the net railway operating income is to the total net income. For example, if the total net income is made up of 90 percent of railroad earnings and 10 percent of earnings from outside investments, 90 percent of the total capitalization is allocated to railroad property and 10 percent to outside investments." (John E. Oldham, op. cit., p. 485.)

should be a controlling influence in the arrangement of any scheme of financing an enterprise.

"Surplus, which is the fund out of which dividends may be paid, gives the next and secondarily significant figure, and the one directly affecting the shareholder. It depends on the fluctuation of net earnings in relation to the amount that interest charges consume. We may call this the 'financial risk' as distinct from the business risk." Walter Hastings Lyon, *Capitolization, A Book on Corporation Finance*, 1912, p. 54.

[12] John E. Oldham, "A Plan for Railroad Consolidations, including a Discussion of Their Purpose and Practicability," *Hearings before the House Committee on Interstate and Foreign Commerce on Railroad Consolidation, H. R. 1212*, 69th Cong., 1st sess., pp. 481–486.

Rate of Return on Capitalization

	Net operating income (percent to gross)[2]	Capitalization per $1 of gross operatiog income (see table above)	Rate of return earned on capitalization	Both groups capitalized $4.07—Rate of return earned	Both groups capitalized $7.03—Rate of return earned
	Percent		*Percent*	*Percent*	*Percent*
Group A	30.7	$4.07	7.54	7.54	4.37
Group B	28.2	7.03	4.01	6.93	4.01

[2] "As net earoings are affected by the amounts charged to maintenance, and as there is no uniformity among railroads in the matter of maintenance accounting, it has seemed desirable for the purpose of comparison to charge to operating expenses the same percentage of gross operatiog income in both groups of roads. The figure used in this case is 28.2 percent, which is the actual average of the roads comprising Group A." *Ibid.*

roads within each group, according to Mr. Oldham, were no greater for the weak roads than for the strong, indicating, according to him, that at least some of the strong roads, if capitalized on the basis of the weak roads, would fall in the category of "weak" roads, whereas some of the weak roads, if capitalized on the basis of "strong" roads, would be regarded as "strong." The conclusion he drew from this study was that "* * * the difference between the financial condition of the strong roads and the weak, in so far as the larger systems hereunder consideration are concerned, is accounted for by the form of their financial structures and has little or nothing to do with the character or quantity of, or the method of handling, their business" [13]

The Rise in the Business Risk [14]

As previously indicated, the last two decades have witnessed an enormous increase in the business risk in railroad enterprises as a result of the great depression and the outbreak of severe competition in the transport field. From 1912 to 1923 Class I, II, and III roads combined carried in excess of 1 billion passengers in every year with two exceptions, 1915 and 1922, and the average for the entire 12-year period was substantially above 1 billion. From 1923 there was an uninterrupted decline in passengers carried to less than 435 million in 1933, and at no time since has the number carried recovered to half the average volume of the 1912–23 period. Even in 1929, the year of record-breaking net railway operating income, the number of passengers carried aggregated less than 786.5 million, a decline of 37 percent below the peak of more than 1.25 billion in 1920.

The number of passenger-miles reached a total of over 40 billion for the first time in 1917 and a peak of nearly 47.4 billion in 1920. By 1929 this figure had declined to not much over 31 billion. At the bottom of the depression in 1933 it stood at about 16.37 billion or not much more than half the figure for 1929 and not much more than one-third of that for the peak year 1920. The highest passenger revenue ever reported by Class I, II, and III roads combined was $1,304,815,000 in 1920. In 1929 the figure had fallen to $875,929,000. Its lowest point since 1900 was reached in 1933 at $329,816,000 or about one-fourth of the revenues of the peak year 1920.

From 1910 to 1930 revenue tons originated by Class I, II, and III roads combined never fell below 1 billion in any year and in a majority of years they exceeded 1.25 billion. From 1931 to 1939 they exceeded the billion mark in only 2 years and negligibly in both cases. The number of revenue tons carried 1 mile passed the 300-billion mark for the first time in 1913. From then until the year 1932 they fell below this figure in only 2 years—1914 and 1915. In the remaining years of this period the ton-miles exceeded 350 billion in 13 years, topped 400 billion in 8 of these 13 and 425 billion in 4. For the period 1932 through 1939 they reached a total of over 300 billion in only 3 years and exceeded 350 billion in only 1.

Freight revenue crossed the 3.5 billion dollar mark in 1918 and the 4 billion mark in 1920, remaining above the latter level through 1930. In 1931 it fell below the 1918 figure and failed to recover to that level by 1939. Indeed in 5 of these 9 years (1931–39) it was below even the 3 billion dollar level. Although the total revenue ton-miles reached their maximum in 1929 at a little over 450 billion, the maximum revenue tonnage originated by Class I, II, and III roads occurred not in 1929 but in 1926 at 1,439,612,000 tons with an all-time high of $4,905,981,000 of revenue. In 1932 the ton-miles (235,308,521,000), revenue tons originated (678,854,000), and freight revenue ($2,485,475,000) were roughly half the foregoing maxima.[15]

These declines in the volume of traffic and gross revenues of the roads were reflected in enormous losses in net railway operating income. From 1923 to 1929 net railway operating income for all railways (including switching and terminal companies) ranged from a little over 1 billion dollars to a little over $1,300,000,000, the latter figure representing the 1929 peak of net railway operating income. For the 5 years 1925–29 the average was $1,218,318,000 per annum. In the 10 years 1930 to 1939 this figure fell as low as 354 millions or only a little more than 27 percent of the peak of 1929. The averages for the 5 years 1930–34 ($569,289,000) and the 5 years 1935–39 ($590,914,000) were less than half the 1925–29 average. (Table 2.)

[13] *Ibid.*, p. 486.

[14] The figures presented in this section are merely a summary. They give no consideration to the possible effects on the totals of any particular factors such as the depression, the competition of other carriers, differences in the rate level or the like.

[15] "Development of Steam Railways: Selected Statistics, 1890–1939," Table 155, I. C. C., *Statistics of Railways in the United States, 1939.*

TABLE 2.—*Railway operating and nonoperating income, interest, and taxes, 1890–1939*

[In thousands]

(All railways except switching and terminal companies from 1908–14, inclusive, and Class III roads and their nonoperating subsidiaries in 1913 and 1914)

Year [1]	Net railway operating income before tax accruals (1)	Railway tax accruals (2)	Net railway operating income (3)	Nonoperating income (4)	Interest accrued on funded debt (5)	Net railway operating and nonoperating income before tax accruals (6)	Net railway operating and nonoperating income (7)	Tax accruals and interest accrued on funded debt (8)
1890	$359,784	$29,806	$329,978	$126,767	$221,500	$486,551	$456,745	$251,306
1891	364,874	32,052	332,822	133,911	219,521	498,785	466,733	251,573
1892	390,409	32,751	357,658	141,961	240,075	532,370	499,619	272,826
1893	392,831	35,071	357,760	149,650	250,177	542,481	507,410	285,248
1894	341,947	36,556	305,391	142,817	252,780	484,764	448,208	289,336
1895	349,651	38,146	311,505	132,432	252,513	482,083	443,937	290,659
1896	377,181	37,962	339,219	129,025	249,624	506,206	468,244	287,586
1897	369,565	41,119	328,446	125,090	247,880	494,655	453,536	288,999
1898	429,353	41,929	387,424	138,203	246,127	567,556	525,627	288,056
1899	456,641	44,397	412,244	148,714	251,158	605,355	560,958	295,555
1900	525,616	44,445	481,171	162,885	252,950	688,501	644,056	297,395
1901	558,129	46,708	511,421	179,746	262,095	737,875	691,167	308,803
1902	610,131	50,054	560,077	196,324	274,422	806,455	756,401	324,476
1903	643,308	53,252	590,056	205,687	283,953	848,995	795,743	337,205
1904	636,278	56,802	579,476	212,934	297,675	849,212	792,410	354,477
1905	691,880	58,712	633,168	231,899	310,632	923,779	865,067	369,344
1906	788,888	69,064	719,824	256,640	322,556	1,045,528	976,464	391,620
1907	840,589	73,743	766,846	286,584	344,243	1,127,173	1,053,430	417,986
1908	713,468	78,674	634,794	356,737	368,296	1,070,205	991,531	446,970
1909	795,614	85,140	710,474	290,223	382,675	1,085,837	1,000,697	467,815
1910	903,132	98,035	805,097	351,576	399,582	1,254,708	1,156,673	497,617
1911	847,326	102,657	744,669	395,528	410,327	1,242,854	1,140,197	512,984
1912	841,277	113,819	727,458	342,359	429,027	1,183,636	1,069,817	542,846
1913	927,271	122,005	805,266	370,502	434,753	1,297,773	1,175,768	556,758
1914	814,660	140,470	674,190	362,565	442,595	1,177,225	1,036,755	583,065
1915	855,706	141,384	714,322	306,598	476,135	1,162,304	1,020,920	617,519
1916	1,250,840	166,212	1,084,628	369,726	495,725	1,620,566	1,454,354	661,937
1917	1,195,480	224,330	971,150	359,542	489,208	1,555,022	1,330,692	713,538
1918	896,366	236,088	660,278		483,970			720,058
1919	713,543	245,968	467,575		493,264			739,232
1920	314,750	296,196	18,554		517,726			813,922
1921	922,130	293,029	629,101	507,322	548,382	1,429,452	1,136,423	841,411
1922	1,124,060	319,124	804,936	432,728	558,274	1,556,788	1,237,664	877,398
1923	1,360,922	350,757	1,010,165	434,755	570,683	1,795,677	1,444,920	921,440
1924	1,374,029	359,008	1,015,021	438,104	607,707	1,812,133	1,453,125	966,715
1925	1,556,161	378,915	1,177,246	444,576	607,235	2,000,737	1,621,822	986,150
1926	1,680,419	410,758	1,269,661	471,121	605,256	2,151,540	1,740,782	1,016,014
1927	1,511,741	397,059	1,114,682	486,046	606,739	1,997,787	1,600,728	1,003,798
1928	1,633,925	410,146	1,223,779	490,873	602,188	1,124,798	1,714,652	1,012,334
1929	1,723,689	417,466	1,306,223	539,432	604,757	2,263,121	1,845,655	1,022,223
1930	1,280,181	367,844	912,337	530,876	614,587	1,811,057	1,443,213	982,431
1931	884,247	322,006	562,241	456,503	621,253	1,340,750	1,018,744	943,259
1932	645,911	291,781	354,130	358,182	619,400	1,004,093	712,312	911,181
1933	780,404	265,966	514,438	355,216	619,834	1,135,620	869,653	885,800
1934	758,598	255,301	503,297	350,670	599,775	1,109,268	853,967	855,076
1935	797,787	253,388	544,399	330,515	589,006	1,128,302	874,914	842,394
1936	1,066,269	343,010	723,259	350,587	578,004	1,416,856	1,073,846	921,014
1937	987,102	348,303	638,799	314,402	560,549	1,301,504	953,201	908,852
1938	771,701	362,353	409,348	279,354	549,742	1,051,055	688,702	912,095
1939	1,019,790	381,024	638,766	292,292	540,265	1,312,082	931,058	921,289

[1] Year ending with June 30 from 1890 to 1915, inclusive; year ending with December 31 from 1916 to 1939, inclusive.

Source: Interstate Commerce Commission, *Statistics of Railways in the United States*, 1890–1939.

Effect of Railway Taxes on the Business Risk

An important factor in the increased business risk in railroad enterprise during the depression period was the burden of railway taxes. This burden has been a consistently though somewhat irregularly mounting one for 40 years beginning with 1890. In 1929 it reached a peak of over 417 million dollars and averaged better than 402 million for the 5-year period 1925–29. Table 2 shows that this 1925–29 average was more than 12 times that of the 5 years 1890–94 when railway taxes aggregated a trifle under 33.25 million.[16]

The wisdom or justification of these increases and the arguments regarding these questions are matters

[16] In connection with railway taxes, the statements of Fairfax Harrison, former president of the Southern Railway, to the company's stockholders in 1926 are not only interesting but somewhat prophetic. Mr. Harrison said:

"The steady tendency of increase of this fixed charge, over which management has no control, may fairly be said to be an element of danger in the financial outlook of the state governments as well as of this company. During the past few years of comparative prosperity the company's revenues have been able to bear the burden and the government budget maker has been alert to take advantage of his opportunity; but the public has not begun to realize that what is taken from a railroad for taxes in such years above a fair contribution to the support of economical government is taken, not from the stockholder, but from the fund which would otherwise be available for, and in the case of the Southern would be invested in, additions and betterments to railroad property, of which the public would be the greatest beneficiary in greater safety and facility in the movement of commerce. But in the event of a severe business depression which (absit omen!) may be expected in the cycle of commercial activity indicated by experience tables, the time may come when an annual charge of 10 millions a year may be actually embarrassing even to the volume of revenues of a great railroad; and it may be fairly doubted whether the government budget maker will then be able to reef his sails as promptly as the managers of industry are trained to do. If he is not able so to do, it is not improbable that government as well

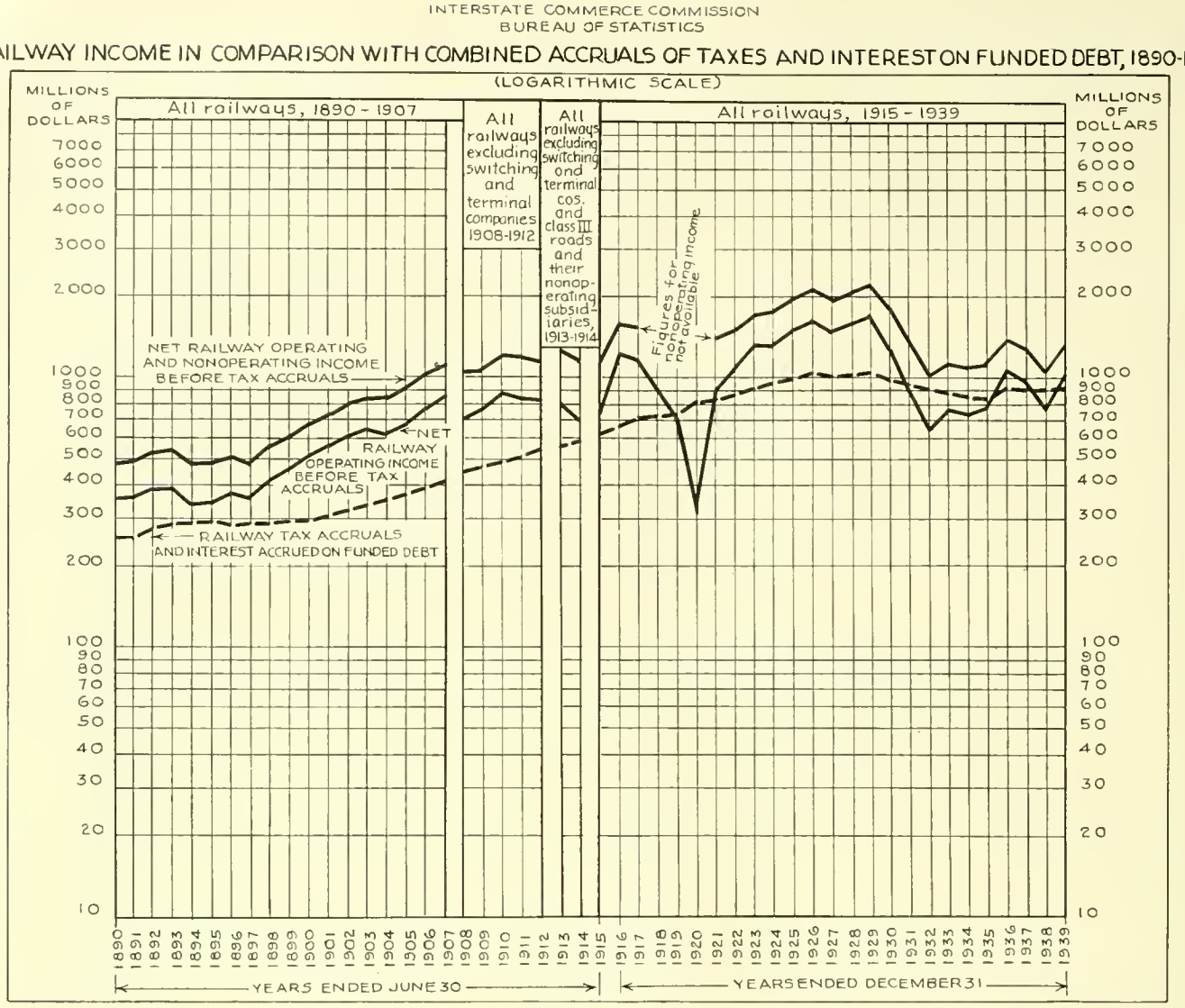

FIGURE 13

which lie quite outside the scope of this discussion.[17] It is pertinent to point out, however, that the tax burden of the roads increased much more rapidly than their ability to pay as measured by either their volume of net railway operating income before taxes or by the total of their net railway operating and nonoperating income before taxes. In the 5-year period 1890–94 net railway operating income before tax accruals covered these accruals by 11.128 times and in the 5 years 1900–1904 (the peak in terms of coverage), 11.834 times. By 1925–29, the all time peak of average railway earnings, this coverage had been reduced to 4.024 times (Table 6). Although taxes were reduced substantially during the depression period, the coverage in terms of net railway operating income before taxes continued to fall during the depression and reached a low point of only 2.750 times in the 5 years 1935–39 (Table 6). If nonoperating income is added to the railway operating income before tax accruals, there is little change in this picture except that the coverage is somewhat higher throughout. The highest and lowest coverages of the tax accruals in this comparison occur in the same periods as those in the preceding

as railroad may be in straits." (*Thirty-Third Annual Report of Southern Railway Company to its stockholders*, year ended December 31, 1926, p. 5.) In 1929 taxes paid by the Southern Railway consumed 6.51¢ out of each dollar of its gross revenue, compared with 8.24¢ in 1938, 7.88¢ in 1939, and 7.92¢ in 1940. These figures compare with the following cited by President Harrison in the same Southern Railway report: "* * * The tax collectors took 6.7¢ out of each dollar of gross revenue in 1926, compared with 6.3¢ in 1925, with 5.4¢ in 1924, with 4.6¢ in 1923, with 4.5¢ in 1922 and with 3.6¢ in 1921."

[17] For a detailed consideration of these matters see *Public Aids to Transportation*, Section of Research, Federal Coordinator of Transportation, Vol. II, Pt. II, pp. 173 ff.

one, 1900–1904 and 1935–39, respectively, at 15.645 and 3.679 times.

Figure 13 shows on a logarithmic scale the railway tax accruals from 1890 to 1939 in comparison both with net railway operating income before tax accruals and with net railway operating and nonoperating income before tax accruals. The annual figures on which the chart is based appear in Table 2.

TABLE 3.—*Railway Stock and Funded Debt Actually and Nominally Outstanding and Nominally Issued, 1876–1939*

Railways included	Year [1]	Capital stock	Funded debt	Total capital stock and funded debt	Ratio of funded debt to total capital stock and funded debt
All railways of the United States	1876	$2,248,358,375	$2,165,141,368	$4,413,499,743	49.06
	1877	2,313,278,598	2,255,318,650	4,568,597,248	49.37
	1878	2,292,257,877	2,297,790,916	4,590,048,793	50.06
	1879	2,395,647,293	2,319,489,172	4,715,136,465	49.19
	1880	2,708,673,375	2,530,874,943	5,239,548,318	48.30
	1881	3,177,375,179	2,878,423,606	6,055,798,785	47.53
	1882	3,511,035,824	3,235,543,323	6,746,579,147	47.96
	1883	3,708,060,583	3,500,879,914	7,280,940,497	48.56
	1884	3,762,616,686	3,669,115,772	7,431,732,458	49.37
	1885	3,817,697,832	3,765,727,066	7,583,424,898	49.66
	1886	3,999,508,508	3,882,966,330	7,882,474,838	49.26
	1887	4,191,562,029	4,186,943,116	8,378,505,145	49.97
	1888	4,438,411,342	4,624,035,023	9,062,446,365	51.02
	1889	4,495,099,318	4,828,365,771	9,323,465,089	51.79
All railways of the United States 1890–1907	1890	4,409,000,000	4,574,576,131	8,983,576,131	50.92
	1891	4,451,000,000	4,840,266,412	9,291,266,412	52.09
	1892	4,633,000,000	5,053,038,050	9,686,038,050	52.17
	1893	4,669,000,000	5,225,689,821	9,894,689,821	52.81
	1894	4,834,000,000	5,356,583,019	10,190,583,019	52.56
	1895	4,962,000,000	5,385,495,573	10,347,495,573	52.05
	1896	5,227,000,000	5,340,338,502	10,567,338,502	50.54
	1897	5,365,000,000	5,270,365,819	10,635,365,819	49.53
	1898	5,388,000,000	5,430,285,710	10,818,285,710	50.19
	1899	5,515,000,000	5,518,943,172	11,033,943,172	50.02
	1900	5,845,000,000	5,645,455,367	11,490,455,367	49.13
	1901	5,806,000,000	5,881,580,887	11,687,580,887	50.32
	1902	6,024,000,000	6,109,981,669	12,133,981,669	50.35
	1903	6,156,000,000	6,444,431,226	12,600,431,226	51.14
	1904	6,340,000,000	6,873,225,350	13,213,225,350	52.02
	1905	6,554,000,000	7,250,701,070	13,804,701,070	52.52
	1906	6,804,000,000	7,766,661,385	14,570,661,385	53.30
	1907	7,357,000,000	8,725,284,992	16,082,284,992	54.25
All railways excluding switching and terminal companies and their nonoperating subsidiaries, 1908–12	1908	7,373,212,323	9,394,332,504	16,767,544,827	56.03
	1909	7,686,278,545	9,801,590,390	17,487,868,935	56.06
	1910	8,113,657,380	10,303,474,858	18,417,132,238	55.94
	1911	8,470,717,611	10,738,217,470	19,208,935,081	55.90
	1912	8,622,400,821	11,130,135,443	19,752,536,264	56.35
All railways except switching and terminal companies and Class III roads and their nonoperating subsidiaries, 1913–14	1913	8,610,611,327	11,185,514,385	19,796,125,712	56.50
	1914	8,680,759,704	11,566,541,553	20,247,301,257	57.13
All railways of the United States 1915–39	1915	9,128,880,051	12,464,042,481	21,592,922,532	57.72
	1916	9,182,450,611	12,377,679,554	21,560,130,165	57.41
	1917	9,452,696,913	12,344,314,539	21,797,011,452	56.63
	1918	9,203,924,688	12,132,671,249	21,336,595,937	56.86
	1919	9,244,882,479	12,276,834,112	21,521,716,591	57.04
	1920	9,289,447,141	13,240,518,438	22,529,965,579	58.77
	1921	9,248,680,412	13,685,430,264	22,934,110,676	59.67
	1922	9,309,835,325	13,621,235,390	22,931,070,715	59.40
	1923	9,419,094,866	14,055,321,007	23,474,415,873	59.88
	1924	9,649,149,554	14,627,901,301	24,277,050,855	60.25
	1925	9,718,520,236	14,622,250,585	24,340,770,821	60.07
	1926	9,664,947,915	14,713,176,912	24,378,124,827	60.35
	1927	9,837,592,988	14,469,016,066	24,306,609,054	59.53
	1928	10,020,417,355	14,421,859,587	24,442,276,942	59.00
	1929	10,104,624,346	14,592,863,497	24,697,487,843	59.09
	1930	10,270,441,089	14,833,253,269	25,103,694,358	59.09
	1931	10,267,623,394	14,851,825,119	25,119,448,513	59.12
	1932	10,302,045,423	15,315,942,847	25,617,988,270	59.79
	1933	10,291,663,888	15,258,652,410	25,550,316,298	59.72
	1934	10,224,154,026	15,156,099,336	25,380,253,362	59.72
	1935	10,209,337,162	14,846,823,660	25,056,160,822	59.25
	1936	10,227,569,573	14,597,259,987	24,824,829,560	58.80
	1937	10,307,668,563	14,627,954,347	24,935,622,910	58.66
	1938	10,283,388,029	14,378,097,340	24,661,485,369	58.30
	1939	10,269,250,248	14,141,107,304	24,410,357,552	57.93
Total		450,084,506,805	578,605,456,329	1,028,689,963,134	56.25

[1] Year ending with June 30 from 1876 to 1915, inclusive; year ending with December 31 from 1916 to 1939, inclusive.

Sources: Poor's Manual of Railroads, 1889, p. iv, and Poor's Manual of Railroads, 1891, p. iv. Interstate Commerce Commission, Statistics of Railways of the United States. For capital stock from 1890 to 1907, Table 155, 1938; for funded debt, 1890–1907, Table 11, 1890–1907; for capital stock and funded debt, 1915–16, Tables 16 and 17; in 1917, Tables 17 and 18: in 1918, Tables 18 and 19; in 1919–20, Tables 18 and 20; in 1922–37, Tables 17 and 20: in 1938–39, Tables 141–142. Inclusions and exclusions of minor items and explanations shown in the footnotes to the foregoing tables in the Statistics of Railways have not been repeated in this table. For these items the footnotes to the figures in the indicated reports may be consulted.

TABLE 4.—*Comparative Growth of Railway Capital Stock and Funded Debt, 5-Year Averages, 1876–1939*

Source [1]	Period (inclusive)	Capital stock	Funded debt	Total capital stock and funded debt	Ratio of funded debt to total capital stock and funded debt
					Percent
Poor's Manual of the Railroads	[2] 1876–1879	$2,312,385,536	$2,259,435,027	$4,571,820,563	49.42
	1880–1884	3,373,552,329	3,162,967,512	6,536,519,841	48.39
	1885–1889	4,188,455,806	4,257,607,461	8,446,063,267	50.41
I. C. C. Statistics of Railways in the United States	1890–1894	4,599,200,000	5,010,030,687	9,609,230,687	52.14
	1895–1899	5,291,400,000	5,358,085,755	10,680,485,755	50.46
	1900–1904	6,034,200,000	6,190,934,900	12,225,134,900	50.64
	1905–1909	7,154,898,174	8,587,714,068	15,742,612,242	54.55
	1910–1914	8,499,629,368	10,984,776,742	19,484,406,110	56.38
	1915–1919	9,242,566,948	12,319,108,387	21,561,675,335	57.13
	1920–1924	9,383,241,460	13,846,081,280	23,229,322,740	59.61
	1925–1929	9,869,220,568	14,563,833,329	24,433,053,897	59.61
	1930–1934	10,271,185,564	15,083,154,596	25,354,340,160	59.49
	1935–1939	10,259,442,715	14,518,248,528	24,777,691,243	58.59

[1] For detailed explanations regarding the figures used, see text footnote.
[2] 4-year average.

The Rise in the Financial Risk

Despite the important increases in business risk, resulting from increased taxes and from the losses in traffic volume, revenues, and net railway operating income referred to above, the figures do not indicate that the difficulties of the roads as a whole arose from these conditions alone. Although the losses of traffic and revenues in the depression years were little less than terrific when compared with the 1920's, net railway operating income nonetheless averaged about 550 million dollars per annum from 1930 to 1939. In addition, the railroads received several hundred million dollars of nonoperating income in this period, although much of this, of course, represented interrailroad payments. Further explanation of the financial difficulties of a number of the roads, therefore, must be sought in their financial structure.

Whatever may be said in justification of the railroad financial structure in the terms of the economic conditions which produced it (and there is much), the fact remains that it was on the whole poorly adapted to meet or resist the increased financial risk in railroad enterprises resulting from the rapid and extensive increase in business risk which began about the middle 1920's. A qualification is that these statements apply to the roads considered as a whole which necessarily are composed of both the financially strong and the financially weak companies. The latter point has already been indicated by the Oldham figures, and is further developed later.

The Expansion of Railway Funded Debt

Until the turn of the last century railway capitalization was about equally divided between bonds and stock. In the decade 1876–85 there was only 1 year in which the proportion of bonds exceeded 50 percent and the excess was inconsiderable. In 1888, however, the debt ratio rose slightly to above 51 percent and remained at a figure of between 50 and 53 percent in the decade from 1890–99 except for the year 1897.[18] Even in the next 5 years from 1900 to 1904 the debt stood above 51 percent in only the last 2 of these years. Despite this fact the debt increased somewhat in each one of these 5 years so that beginning with 1900 the ratio of debt to total capital stock and funded debt shows a rather consistent though irregular increase, rising from 49.13 percent of the total stock and funded debt in 1900 to the peak of 60.35 reached in 1926. From this year there has been an irregular decline to 57.93 percent in 1939.

Table 3 shows by years the capital stock and funded debt of railway companies from 1876 to 1939. Table 4 shows 5-year averages of these figures for the same period.[19]

[18] In terms of stock and bond values, the latter probably exceeded greatly the former at this time.

[19] It is not possible, unfortunately, to present a continuous series showing the relation of capital stock and funded debt on a strictly uniform basis. These tables and the chart following, therefore, have been compiled from such figures as are available. The following statements explain the statistics used. The Interstate Commerce Commission's figures for railway capitalization began with the year 1890 and no Commission figures are available prior to that date. *Poor's Manual* for the year 1891 (p. iv), however, contains a table which gives funded debt and capital stock from 1876 to 1890. The data in Poor's table purport to show, among other things, the share capital and funded debt for "all the railroad companies of the United States" for the fiscal years 1875–76 to 1888–89. (Presumably this refers to the fiscal years used by each road.) For the fiscal years ending June 30 from 1890 to 1907 the Commission's capitalization figures contained in the *Statistics of Railways* presented the capital stock and funded debt actually and nominally outstanding and nominally issued for all railways of the United States, including switching and terminal companies. For the fiscal years from 1908 to 1912, the Commission excluded switching and terminal companies from the figures for total capital stock and funded debt, and for the fiscal years ending in 1913 and 1914 the Commission also excluded from the stock and debt figures all Class III roads and their lessor subsidiaries in addition to switching and terminal companies. Beginning in the fiscal year ending in 1915 and continuing with the calendar years 1916 to 1939, the figures of funded debt and capital stock are again available for all railway companies, including Class III roads and their lessors as well as switching and terminal companies. The capitalization of proprietary companies is excluded throughout. For the fiscal yars 1908 to 1914 it would be impossible to present the figures for all railways combined

In both the 4-year period 1876–79 and the 5-year period 1880–84, total funded debt averaged less than 50 percent of the total capital stock and funded debt but rose but slightly above that figure in 1885–89. The receiverships of the 1890's did not result in any drastic reduction either in the amount or proportion of total funded debt so that the average proportion of bonds outstanding in the 5 years 1895–99 was less than 2 percent below that for the first 5 years of the 1890's. From 1895–99 the 5-year averages of the proportions of funded debt to the total capitalization rose consistently to 59.61 percent for the period 1920–24 and remained at the same figure throughout the following 5 years. An equally consistent decline in the proportion was registered in 1930–34 and 1935–39. In terms of 5-year averages the peak of total capitalization as well as of both capital stock and funded debt was reached in the period 1930–34. In that period the total capitalization averaged 5.5 times that for the 4 years 1876–79. Between the same periods the capital stock average increased only 4.4 times, but funded debt average rose 6.7 times.[20]

Figure 14 presents in graphic form the growth of funded debt and capital stock from 1876 through 1939.

Factors in Railway Debt Expansion

The causes of this expansion in funded debt, either relative to the growth of capital stock or otherwise,

except by tedious and expensive processes of special tabulations of roads excluded from stock and debt figures in those years. The fact that the figures do not represent an identical sample throughout has been disregarded in the 5-year averages shown in the table, but the table and chart have been constructed to show the exact character of the figures employed.

[20] The foregoing statements ignore the net increase in railroad investment from earnings. If all these had been capitalized by stock dividends, the proportion of stock in the total capitalization would have been higher.

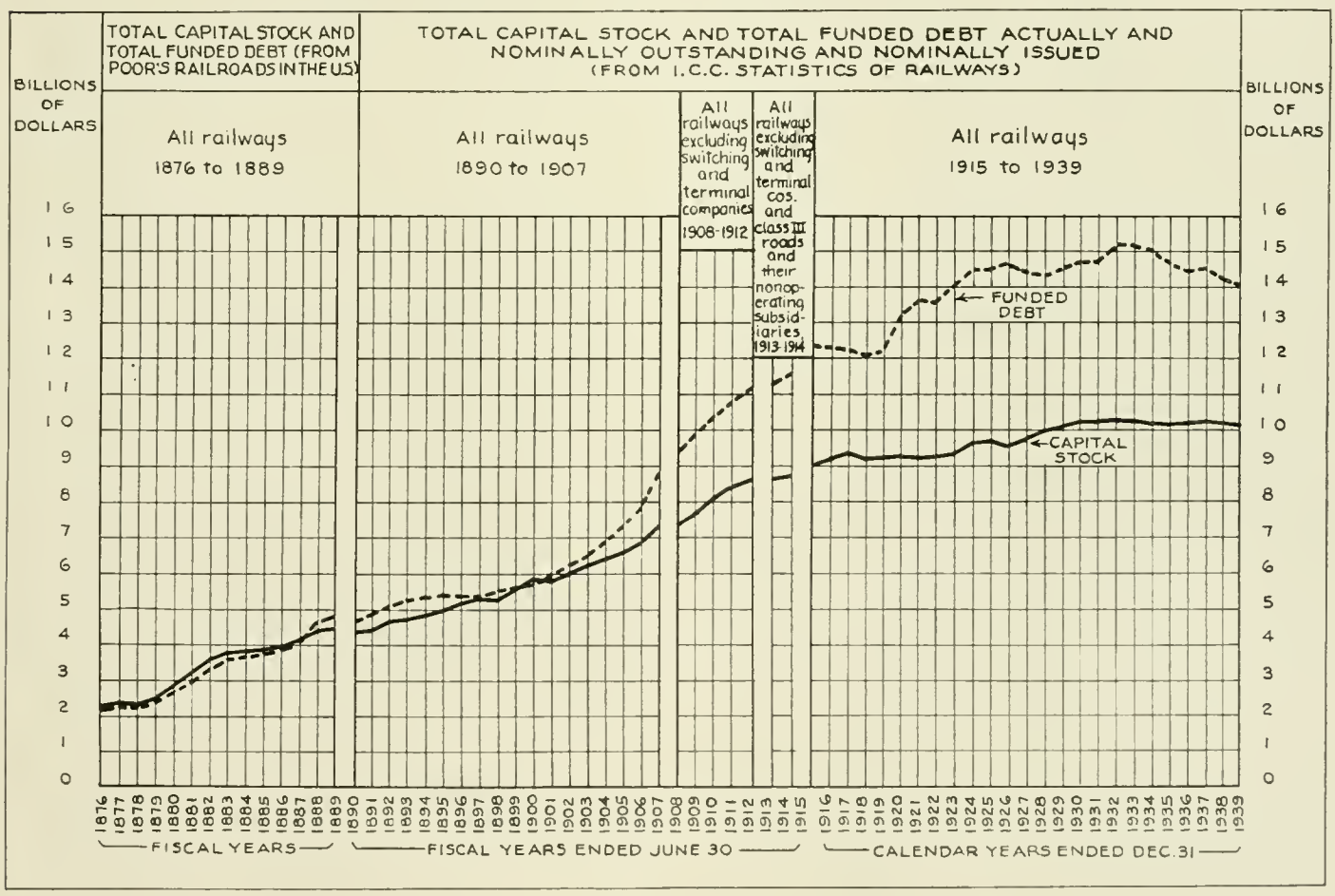

FIGURE 14

must in the nature of the case remain largely conjectural. A variety of elements, no doubt, were influential.[21] But it may be suggested that two fundamental factors were essential. The first was the earning power theory of bonds[22] with its corollary of the nonnecessity of railroad debt repayment;[23] the second was the general acceptance of this theory by the investing public. Without the latter, so large an expansion of railroad debt might well have proved more difficult or even entirely impracticable.

Probably the most important factor in the general acceptance by the public of the idea of the nonrepayment of railroad debt was the highly monopolistic position occupied by the railroads in transportation service, but this consideration was importantly reinforced by the development of public control of railroad enterprises. Rate regulation, the physical valuation of railway enterprises, and finally control of rail security issues, all, no doubt, played important roles in the attitude of the public toward railway funded debt and its continued willingness to purchase railroad bonds.

Some time before the turn of the century the railroads as a whole had very largely established themselves in the public mind as the permanent transportation agency of the Nation, destined, in the nature of the case, to monopolize substantially the carriage of passengers and freight. This attitude was influenced in no small degree by regulatory policy. Rate regulation by the State legislatures began as early as the 1870's. Although this was primarily in response to public reaction against exorbitant rates, it was based on a rapidly growing recognition of the view that the railroad business as a whole was affected with a public interest owing to its increasingly monopolistic position in the transportation of persons and commodities.

[21] For example, leverage in favor of the common stock and institutional investor requirements for bonds. Another factor—taxes—is considered at a later point in the study.

[22] This theory was developed in detail by Greene. He pointed out the difference in the character of highly specialized property devoted to the transportation service and nonspecialized property representing various kinds of real estate. In the case of the latter type of property, the security of mortgages thereon resided primarily in the value of the property as such. In the case of railroad property, on the other hand, the property as such possessed little or no value for any other purposes than the transportation of passengers and freight. In consequence, a mortgage on railroad property, despite the language of the indenture, was not in reality secured by the property at all but rather by the earnings. If earnings failed and the railroad property were sold, the number of possible buyers would be exceedingly limited and no buyer, unless he expected to continue to operate the property as a transportation company, would offer therefore more than a fraction of its value. Moreover, public interest in the transportation of passengers and freight would demand that the property be continued in operation and not scrapped. Consequently, such specialized property would not be sold, but the corporation's capitalization would be revised to accord with the earning power of the company. Thomas L. Greene, *Corporation Finance* (1897), especially Chapter III.

[23] On the policies and extent of railroad debt repayment through sinking funds, see Stevens, *Railroad Sinking Funds and Funded Debt*, I. C. C., Bureau of Statistics, 1939, Tables 1–3, pp. 13–15. Cf. also A. S. Dewing, *Financial Policy of Corporations*, Vol. III, pp. 126–27.

The original Act to Regulate Commerce of 1887 was directed essentially against unreasonable and unjust personal and local discriminations in rates and charges. Although it contained no specific authority for the Commission to prescribe rates for the future, it was believed by many for more than a decade, including the Commission itself, that this body had been given that power. Additional authority granted to the Interstate Commerce Commission by the Elkins Act of 1903, the Hepburn Act of 1906, and the Mann-Elkins Act of 1910 provided important links in a comprehensive system of railway regulation, thus strengthening the public belief in the permanency of the railroad monopoly of transportation. The requirements of these acts for the publication and filing of tariffs, the long-and-short-haul clause, together with other regulations and prohibitions, may well have induced some part of the public to believe that railway earning power under this system of regulation would be as well or better maintained than theretofore.

Later on, in 1920, the minimum rate authority given to the Commission by the Transportation Act of that year tended to justify the view that rates would not be allowed to fall too low, with the consequent implication that earnings would in the future be somewhat better protected than previously. Such a view was reinforced by the fact that, in giving the Commission this minimum rate-control, Congress also enacted a rate-making rule imposing upon that body the affirmative duty of making rates which would yield the railways a fair return. This requirement, however, as well as the recapture of excess-earnings provision of the same Act, imposed a maximum limitation on such earnings.

The new rate-making rule was the outgrowth of the "fair rate of return on fair value" theory and the physical valuation of railway property. The original Act to Regulate Commerce of 1887, in authorizing the Commission to require annual reports from common carriers, had provided that such reports should show, among other things, the cost and value of the carrier's property franchises and equipment.[24] Several years later the United States Supreme Court in the famous case of *Smyth* v. *Ames* held "that the basis of all calculations as to the reasonableness of rates to be charged by a corporation maintaining a highway under legislative sanction must be the fair value of the property being used by it for the convenience of the public".[25] Texas, Michigan, and Wisconsin began valuations of railroad property around the turn of the century. Though made largely for tax purposes, these State reports tended to focus attention upon the physi-

[24] However, it should be noted that the Commission had no authority to prescribe accounts for the carriers until 1906.

[25] 169 U. S. 466, 546 (1898).

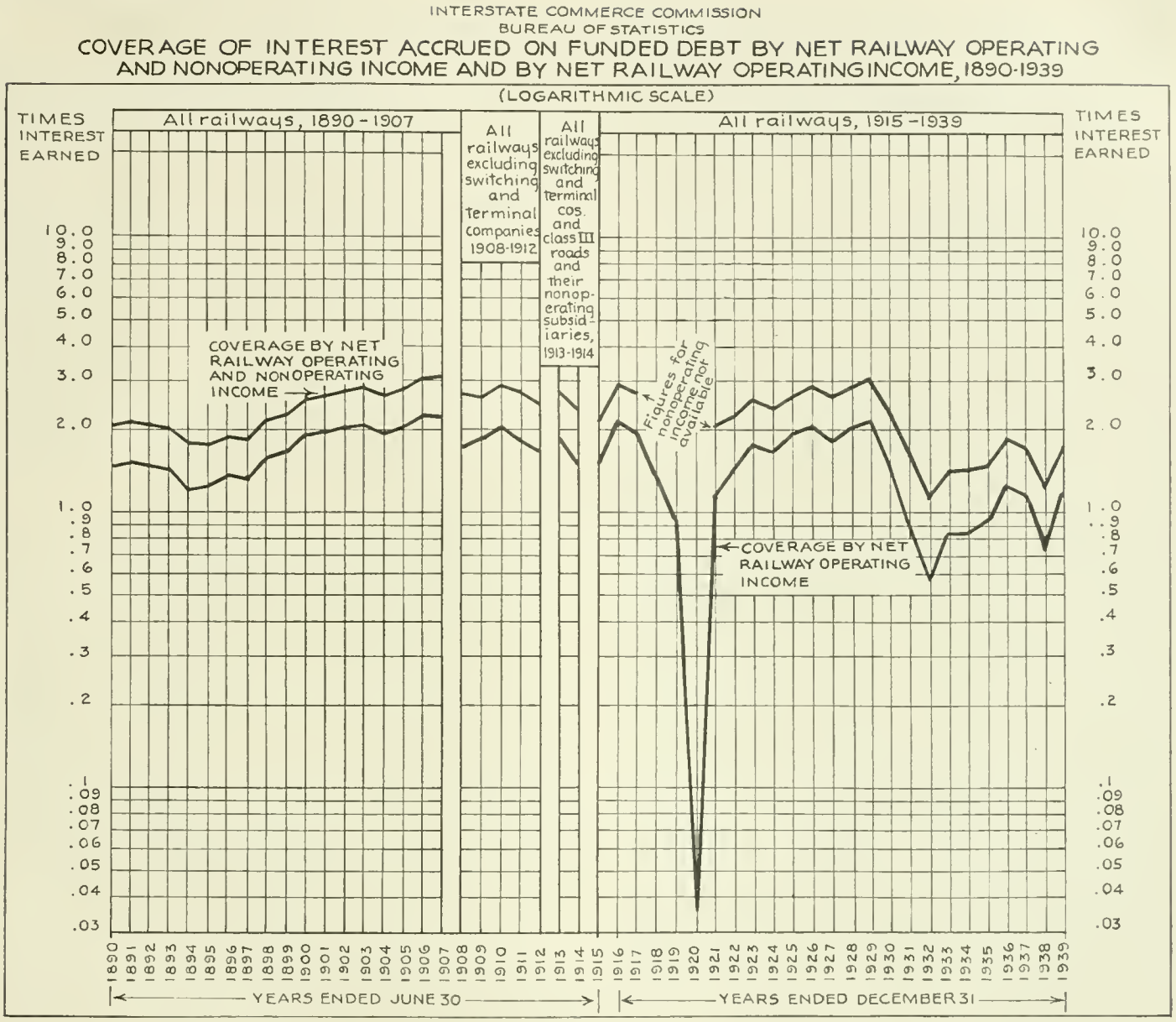

FIGURE 15

cal value of rail properties by demonstrating both the practical possibilities and concrete application of such valuations. Beginning in 1903 the Interstate Commerce Commission urged railroad valuation upon the Congress by its repeated recommendations. The Commission's annual reports reflect the view that valuation was needed for the determination of rates as well as for regulatory and other purposes, including taxation, depreciation, and capitalization.[26] Reinforced by the favorable report of the Railroad Securities Commission, these recommendations were finally accepted in the passage of the Valuation Act of 1913. Long before the fair return mandate in the act of 1920, therefore, the doctrine that the railroads were entitled to earn a fair rate of return on a fair value of their property had come to be a rather generally accepted theory.

Another factor contributing to the public acceptance of the expansion of railroad funded debt and the nonnecessity of debt repayment after 1920 was the legislation of that year giving the Interstate Commerce Commission control over the issuance of railway

[26] Cf. *Annual Reports*, Interstate Commerce Commission, 1903, p. 26; 1907, p. 150; 1908, pp. 84-85; 1909, p. 6. For further detail, see *Interstate Commerce Commission Activities*, 1887-1937, notes to p. 143.

securities. As early as 1894 that body had pointed out that "Until there is some practical restriction upon the capitalization of railway properties at fictitious values, there must still continue to be nondividend-paying stock, defaulted interest on bonds, receiverships, and foreclosure sales."[27] With the sole exception of the year 1918,[28] every annual report of the Commission from 1908 to 1919 recommended Government control of railway capitalization.

These developments, extending over a period of more than half a century, laid an excellent foundation for the acceptance on the part of both the railroads and the public of the theory of a permanent nonrepayable[29] funded debt which would more or less continuously increase with the growth of population and traffic in an absolute sense though perhaps not relatively to capital stock. The railroads, considered as a whole, possessed a substantial monopoly of the transportation of passengers and freight. Although their earning power during much of the 1890–1940 period was subjected to maximum-rate regulation, it was at the same time protected at first by prohibitions against discriminatory rates and charges and deviations from published rates, later by a multitude of other regulations, and finally, in 1920, by minimum-rate control. A comprehensive valuation of the railroads was ordered by the Congress in 1913 and completed by the Interstate Commerce Commission, and the mandate of the act of 1920 required the application of the "fair rate of return" theory to rate making. Finally, in 1920, the issuance of stocks and bonds, long urged, was subjected to regulation. Funded debt would not be unduly expanded, it was thought, because bonds could be issued only with the authority of the Commission. Convinced by these and other factors of the imperviousness of the rail-transport monopoly to the impact of economic change, it is scarcely remarkable that the public continued to purchase railroad bonds for some 40 years after 1890, despite the steadily expanding volume of funded debt and interest charges and despite, as subsequently indicated, the decline in coverage of these interest charges by earnings after 1909.

[27] *Annual Report of the Interstate Commerce Commission*, 1894, p. 69. It should be noted that this year (1894) represented the peak in the proportion of capitalization in the hands of receivers prior to the regulation of security issues. Curiously enough this proportion was approximately the same as that in 1938, which was the peak year for the depression of the 30's, in the proportion of capitalization in the hands of receivers and trustees after nearly 2 decades of securities issue regulation.

[28] *Interstate Commerce Commission Activities*, 1887–1937, p. 164.

[29] All the bonds and mortgages securing them, however, ran for a definite term. At maturity the debt was continued through refunding in the form of a new mortgage with a new bond issue. The new bonds were sold to a new set of creditors and the proceeds used to pay off the old ones.

The Declining Coverage of Interest Charges by the Earnings

Whether or not one agrees with the foregoing theories, the turn of events since 1929 has indicated all too well the perniciousness of the doctrine of a permanent nonrepayable funded debt. The expansion of the funded debt after 1890 both in absolute amount and relative to the increase of total capitalization was accompanied by an appreciable increase in the financial risk of railroad enterprises considered as a whole, i. e., in the coverage of interest charges by the earnings. This decline began before the outbreak of World War I and except for the brief period of 1925–29 continued with little interruption until the late 1930's. This is shown graphically in Figure 15, which compares railway income with interest accrued on funded debt during the 50-year period 1890 to 1939. The annual figures on which this chart is based are given in Table 2.

In Table 5 these annual[30] figures are presented by 5-year averages, i. e., the interest accrued on funded debt in comparison with the average net railway operating income, nonoperating income, and combined operating and nonoperating income both before and after taxes. From 1890–94 to 1930–34 the average annual interest accruals by 5-year periods increased uninterruptedly from a little less than 237 million to not quite 615 million or by more than 1.5 times. At the same time the net railway operating income (after tax accruals) rose from an average of nearly 337 million in 1890–94 to over 1.2 billion in 1925–29, an increase which also was uninterrupted except for the period 1920–24 when the 5-year average fell to a point but little above that of 1905–09.

Nonoperating income also showed a similar uninterrupted increase from 1890 to 1930 except for the 5-year periods 1895–99 and 1915–19. If net railway operating income, be combined with the nonoperating income, there was an uninterrupted increase from 1890–94 through 1925–29, a period 5 years shorter than that of the uninterrupted increase in interest accruals. From the low point of 1890–94 to the

[30] Rent for leased roads and equipment has not been considered in this table. With the exception of payments to private car lines and some others, these rentals represent intercompany payments when the figures for the roads as a whole are considered as in this table. There is also a large amount of duplication between these figures and nonoperating income, rents reported paid by the lessee being frequently in the form of interest and dividends on the lessor companies' securities and reported as nonoperating income by the latter. Finally, though these payments have shown a high percentage of increase during the period as an increasing number of roads have been leased, this increase is in no way comparable in either absolute or relative terms with that of taxes or interest on funded debt. In 1890 the rent for leased roads (which presumably though not certainly included equipment rents) was over $91,000,000. In 1939 it was less than $154,000,000.

TABLE 5.—*Averages of Railway Operating and Nonoperating Income, Interest, and Taxes, by 5-Year Periods, 1890–1939*

[All railways except switching and terminal companies from 1908–14, inclusive, and Class III roads and their nonoperating subsidiaries in 1913 and 1914, in thousands]

Period (inclusive)[1]	Net railway operating income before tax accruals (1)	Railway tax accruals (2)	Net railway operating income (3)	Nonoperating income (4)	Net railway operating and nonoperating income (5)	Net railway operating and nonoperating income before tax accruals (6)	Interest accrued on funded debt (7)	Tax accruals and interest accrued on funded debt (8)
1890–1894	$369,969	$33,247	$336,722	$139,021	$475,743	$508,990	$236,811	$270,058
1895–1899	396,478	40,711	355,768	134,693	490,460	531,171	249,460	290,171
1900–1904	594,692	50,252	544,440	191,515	735,955	786,208	274,219	324,571
1905–1909	766,088	73,067	693,021	284,417	977,438	1,050,504	345,680	418,747
1910–1914	866,733	115,397	751,336	364,506	1,115,842	1,231,239	423,257	538,664
1915–1919 [2]	982,387	202,796	779,591	[3] 345,289	[4] 1,124,880	[5] 1,327,676	487,660	690,457
1920–1924	1,019,178	323,623	695,555	[6] 453,227	[7] 1,148,782	[8] 1,472,405	560,554	884,177
1925–1929	1,621,187	402,869	1,218,318	486,410	1,704,728	2,107,597	605,235	1,008,104
1930–1934	869,868	300,580	569,289	410,289	979,578	1,280,158	614,970	915,549
1935–1939	928,530	337,616	590,914	313,430	904,344	1,241,960	563,513	901,129

[1] Fiscal years ended with June 30th from 1890 to 1915, both inclusive; calendar years ended with Dec. 31 since 1916.
[2] Does not include the 6-month period ended with Dec. 31, 1915, because figures are not readily available due to change in reporting statistics from a fiscal to a calendar year basis.
[3] Three-year average; fiscal year ended June 30, 1915, and calendar years 1916 and 1917.
[4] Sum of average of net railway operating income for 5 years, 1915–19, and average of nonoperating income for fiscal year ended June 30, 1915, and calendar years 1916 and 1917.
[5] Sum of average of net railway operating income before tax accruals for 5 years 1915–19 and average of nonoperating income for fiscal year ended June 30, 1915, and calendar years 1916 and 1917.
[6] Four-year average, 1921–24.
[7] Sum of average of net railway operating income for 5 years, 1920–24, and average of nonoperating income for 4 years, 1921–24.
[8] Sum of average of net railway operating income before tax accruals for 5 years, 1920–24, and average of nonoperating income for 4 years 1921–24.

Source: Interstate Commerce Commission, '*Statistics of Railways in the United States.*' 1890–1939.

high of 1925–29 the percentage increase in net railway operating income or in net railway operating and nonoperating income combined was greatly in excess of the increase in interest accrued on funded debt. However, these percentage increase figures are somewhat misleading because the fact appears to be that the financial risk for railroads as a whole increased steadily after 1905–9. For some 15 years after 1890–94 the roads experienced a decreasing financial risk in terms of the coverage of interest by net railway operating income. With the expansion of funded debt and interest accruals after 1905–9, however, the financial risk rose rapidly. Table 6 shows that in 1890–94 net railway operating income was sufficient to cover interest charges on the average 1.422 times. From this point the 5-year average coverage increased in each of the three succeeding periods to 2.005 times in 1905–9. In the next three periods it fell sharply and successively to 1.241 times in 1920–24 or substantially below the levels of the nineties. Even the record breaking volume of traffic and earnings in 1925–29 was not sufficient to cover the interest charges more than 2.013 times or negligibly above the 2.005 coverage in 1905–9. Moreover, the total coverage of interest charges as represented by the combined net railway operating and nonoperating income was actually lower in this great prosperity quinquennium of railroad history than it was in 1905–9. In the 5 years 1930–34 the net railway operating income failed to cover the interest charges (0.926 times) and in 1935–39 they were covered only 1.049 times. The number of times interest charges were covered by net railway operating income and by

TABLE 6.—*Coverage of Accrued Interest on Funded Debt and Tax Accruals by Railway Earnings: 5-Year Averages, 1890–1939*

Period (inclusive)	Number of times interest charges were covered by				Number of times taxes were covered by		Number of times both interest and taxes were covered by	
	Net railway operating income before tax accruals (1)	Net railway operating income (after tax accruals) [2] (2)	Net railway operating and nonoperating income before tax accruals (3)	Net railway operating and nonoperating income (after tax accruals) [2] (4)	Net railway operating income before tax accruals (5)	Net railway operating and nonoperating income before tax accruals (6)	Net railway operating income before tax accruals (7)	Net railway operating and nonoperating income before tax accruals (8)
1890–1894	1.562	1.422	2.149	2.009	11.128	15.309	1.370	1.885
1895–1899	1.589	1.426	2.129	1.966	9.739	13.047	1.366	1.831
1900–1904	2.169	1.985	2.867	2.684	11.834	15.645	1.833	2.423
1905–1909	2.216	2.005	3.039	2.828	10.485	14.377	1.829	2.509
1910–1914	2.048	1.775	2.909	2.636	7.511	10.670	1.609	2.286
1915–1919 [3]	2.014	1.599	2.723	2.307	4.844	6.547	1.423	1.923
1920–1924	1.818	1.241	2.627	2.049	3.149	4.550	1.153	1.665
1925–1929	2.679	2.013	3.482	2.817	4.024	5.231	1.608	2.091
1930–1934	1.414	.926	2.082	1.593	2.894	4.259	.950	1.398
1935–1939	1.648	1.049	2.204	1.605	2.750	3.679	1.030	1.378

[1] Fiscal years ended with June 30 from 1890 to 1915, both inclusive; calendar years ended with Dec. 31 since 1916.
[2] "Net Railway Operating Income" in the I. C. C. classification of accounts is arrived at after the deduction of railway tax accruals.
[3] Does not include the 6-month period ended with Dec. 31, 1915, because figures are not readily available due to change in reporting statistics from a fiscal to a calendar year basis.

Source: Interstate Commerce Commission, '*Statistics of Railways in the United States,*' 1890–1939.

net railway operating and nonoperating income from 1890 to 1939 is shown graphically in Figure 15.

It has been shown above that the increase in taxes was one of the major factors in increasing the business risk of railroad enterprise considered as a whole, and that the increasing financial risk of railroad enterprise was the result in large part of a too rapidly expanding volume of funded debt and interest charges. Table 6, therefore, also shows the coverage of the combined railway tax accruals and interest accrued on funded debt by net railway operating income and by net railway operating and nonoperating income before taxes.

The highest average (5-year) coverage of combined interest and taxes by net railway operating income before tax accruals was 1.833 times in 1900–04 from which point it declined continuously, with the exception of 1925–29, to less than once (0.950 times) in 1930–34. Even the traffic and earnings of 1925–29 were not large enough, moreover, to raise this coverage for that period (1.608 times) quite to the level of 1910–14 (1.609 times). However, the average coverage for 1925–29 exceeded comfortably that of the two periods of the 1890's, in both of which it was less than 1.4 times. Combining net railway operating income before taxes with nonoperating income gives a peak coverage for interest and taxes of 2.509 times in 1905–09 and a low of 1.378 times in 1935–39. For the two periods of the 1930's the coverage of interest and taxes combined, either by net railway operating income before taxes or by the combined net railway operating and nonoperating income before taxes, are substantially below those of the two periods of the 1890's. Figure 15 shows by years the trends of combined railway tax accruals and interest accrued on funded debt in comparison with net railway operating income and with the combined net railway operating and nonoperating income before taxes.

Recent Railroad Reorganization Plans

The Financial Risk Factor in Recent Failures

The reorganization or the liquidation of a corporation may result from either an increased business risk or an increased financial risk. Where financial embarrassment is the result of increased business risk, the difficulty is due to the inability of the corporation to earn a sufficient amount to meet its operating expenses, including taxes and rentals. Where it arises from the increased financial risk, however, there is frequently no question of the ability of the corporation to produce a sufficient amount of revenue to cover its cost of operation. In fact the income after the payment of operating expenses may be substantial or even large in terms of its operating revenues. But if a corporation has failed to observe prudence in the use of debt for financing or has met with unexpected or untoward economic changes which increase the business risk, the increased financial risk resulting therefrom may readily bring disaster upon the company. Unless the business risk of the enterprise has risen to a point where there is no margin over the operating costs, however, liquidation is relatively rare. If there is any such margin, the readjustment of the interest charges is frequently, if not usually, sufficient to place the corporation in a sound enough position to operate successfully thereafter.

As has already been pointed out, the difficulties of numerous railroads in the 1930's were due primarily to an increase in the financial rather than the business risk, to the inability to earn their interest charges rather than their operating expenses. To be sure, the business risk in railroad enterprise increased sharply after 1930, but it is equally true that the railroads would not have been so seriously affected thereby but for the long and relatively uninterrupted increase in funded debt and interest charges. The increased business risk, however, gravely aggravated the financial risk with the result that the strong roads now are not nearly as strong as they once were and the weak roads are substantially weaker from the latter as well as the former standpoint.

As previously shown, the roads as a whole, even in the 1930's, averaged between 570 million dollars of net railway operating income after tax accruals in the period 1930–34 and over 590 million dollars in 1935–39, in addition to which they received several hundred million dollars of nonoperating income, although much of this represented interrailway payments. Table 7 shows a tabulation of the coverage of fixed charges by total available income for 56 railway systems based on a 6-year average for the highly prosperous period 1924–29.[31] In this table the roads have been arranged in order of the number of times in which the fixed charges were covered by the total income available for fixed charges. This table shows that during this period these 56 roads as a whole had a coverage of 2.25 times their fixed charges. Even in this period of high prosperity, however, there were 7 of the 56 companies, or more than 12 percent, that earned their fixed charges less than 1.5 times. Seventeen of them, or over 30 percent, covered them less than 1.75 times, and 27, or 48 percent, less than twice. At the opposite end of the

[31] The figures in question are used through the courtesy of John E. Oldham. They are rearranged from a tabular analysis prepared by him for another purpose and have not been checked by this writer. The 56 roads in question, according to Mr. Oldham, had operating revenues equal to more than 90 percent of the total of all the Class I roads in the United States. Mr. Oldham has included rent for leased roads in his fixed charges.

TABLE 7.—*Coverage of Fixed Charges, by Total Available Income for 56 Railroad Systems, 6 Year Average, 1924–29* [1]

[In thousands]

Road	Total income available for fixed charges	Fixed charges, excluding taxes [2]	Coverage of fixed charges by available income
Norfolk & Western	$36,303	$5,442	6.67
Alabama Great Southern	3,214	607	5.29
Atchison, Topeka & Santa Fe [3]	63,777	12,166	5.24
Wheeling & Lake Erie	4,331	1,080	4.01
Pittsburgh & Lake Erie	9,550	2,432	3.93
Chicago, Burlington & Quincy	33,344	9,282	3.59
Pere Marquette	9,748	2,718	3.59
Cincinnati, N. O. & Texas Pac	6,097	1,731	3.52
Chesapeake & Ohio [4]	39,830	12,065	3.30
Union Pacific [5]	59,826	18,165	3.29
Delaware, Lackawanna & Western	21,726	6,861	3.17
Reading [6]	24,775	8,753	2.83
Atlantic Coast Line	20,525	7,459	2.75
Texas & Pacific	7,841	2,863	2.74
Colorado & Southern [7]	6,506	2,574	2.53
Nashville, Chatt. & St. Louis	4,330	1,756	2.47
Louisville & Nashville [8]	27,809	11,387	2.44
Southern Pacific Lines	66,332	27,993	2.37
Northern Pacific	34,715	15,314	2.27
Virginian	8,900	3,933	2.26
New York Central [9]	124,019	55,180	2.25
Great Northern	41,811	18,627	2.24
Southern Railway	38,277	(*a*) 17,711	2.16
New York, Chicago & St. Louis	12,574	5,842	2.15
Pennsylvania [9]	133,654	62,166	2.15
Wabash	12,847	6,070	2.12
Missouri-Kansas-Texas	13,226	(*b*) 6,558	2.02
Chicago, Indianapolis & Louisv	2,820	1,393	2.02
Lehigh Valley	14,505	7,222	2.01
Mobile & Ohio	3,268	1,687	1.94
Chi., Rock Island & Pacific	22,790	11,947	1.91
Central R. R. of New Jersey	11,223	6,104	1.84
Illinois Central [10]	32,717	17,741	1.84
Baltimore & Ohio [11]	56,298	31,184	1.81
Gulf Coast Lines [12]	3,466	1,925	1.80
Kansas City Southern	5,559	3,126	1.78
Western Maryland	5,415	3,052	1.77
Chicago & North Western	24,455	13,044	1.76
Chicago, St. P., Minn. & Omaha	3,089	2,646	
St. Louis Southwestern	4,687	2,711	1.73
Chi., Milw., St. Paul & Pacific	22,707	(*c*) 13,317	1.71
Central of Georgia	6,046	3,596	1.68
New York, New Haven & Hartford [13]	30,225	18,677	1.62
Boston & Maine	12,990	7,997	1.62
Erie	23,460	14,848	1.58
Norfolk Southern	1,617	1,046	1.55
Western Pacific	3,584	2,329	1.54
Missouri Pacific	23,653	15,501	1.53
St. Louis-San Francisco	23,231	15,464	1.50
Maine Central	3,150	2,163	1.46
Chicago Great Western	2,595	1,815	1.43
Florida East Coast	3,586	2,695	1.33
Seaboard Air Line	12,191	(*d*) 9,722	1.25
Chicago & Eastern Illinois	2,636	2,377	1.11
Denver & Rio Grande Western	6,785	6,160	1.10
International-Great Northern	2,514	2,486	1.01
Total	1,237,149	550,710	2.25

[1] These figures are used by the courtesy of John E. Oldham and form a tabular analysis made by him. They have not been checked by the writer. The 56 reads in question, according to Mr. Oldham, had operating revenues equal to more than 90 percent of the total for all Class I roads in the United States.

[2] Rent for leased roads, interest, and miscellaneous charges.

[3] Includes Panhandle & Santa Fe; Gulf, Colorado & Santa Fe; and, since Aug. 1, 1929, Kansas City, Mexico & Orient Lines.

[4] Includes Hocking Valley.

[5] Includes Oregon-Washington R. R. & Navigation Co.; Oregon Short Line, and Los Angeles & Salt Lake.

[6] Covers 4-year period 1926–29 only, as combined figures of 12 subsidiary companies actually consolidated as of Jan. 1, 1929, are not available prior to 1926.

[7] Includes Fort Worth & Denver City, Wichita Valley, and other subsidiaries.

[8] Includes, since 1924, operations of Louisville, Henderson & St. Louis, leased as of June 1, 1929.

[9] Income and fixed charges exclude intercorporate receipts or payments of dividends or interest.

[10] Includes, since June 2, 1926, operations of Alabama & Vicksburg, and Vicksburg, Shreveport & Pacific.

[11] Includes Buffalo, Rochester & Pittsburgh, and Buffalo & Susquehanna.

[12] Includes New Orleans, Texas & Mexico; Beaumont, Sour Lake & Western; St. Louis, Brownsville & Mexico; San Antonio, Uvalde & Gulf; and 11 other subsidiary companies.

[13] Includes Central New England.

(*a*) Includes $226,008 dividends on Southern Ry. Mobile & Ohio stock trust certificates.
(*b*) Includes interest on adjustment mortgage bonds.
(*c*) Excludes $9,143,685 interest on adjustment mortgage bonds paid in each year, 1928 and 1929.
(*d*) Excludes $1,250,000 interest on adjustment mortgage bonds paid in each year, 1924 to 1927, inclusive.

array were 11 roads, or nearly one-fifth, which covered their fixed charges from 3 to over 6 times, and 18 roads, or nearly one-third, with a fixed charge coverage of between 2 and 3 times.

Even when the remarkable earnings of the 1924–29 period are considered, the weak roads in terms of financial risk were still weak roads. It is not surprising, therefore, with the sharp increase in the business risk of railroad enterprises after 1929 that the resulting increase in financial risk was too much for the weaker companies. Practically all of the roads with an average fixed charge coverage of less than 1.75 times in 1924–29 were in the hands of receivers or trustees at the end of 1939. Four large systems with a coverage between 1.75 and 2 times fixed charges (Mobile and Ohio; Chicago, Rock Island & Pacific; Central Railroad of New Jersey; and Chicago & North Western) were in the same position. The Baltimore and Ohio and Lehigh Valley with coverages of 1.81 and 2.01 times fixed charges, respectively, barely escaped. All other roads with a coverage of twice their charges except the Wabash (2.12 times) and the Chicago, Indianapolis & Louisville (2.02 times) weathered the storm, at least for the time being.

The New Capitalization of the Reorganized Roads [32]

Of the Class I and other roads which found themselves unable to meet their interest charges, more than a score passed into the hands of trustees. Under the terms of Section 77 of Chapter 8 of the Bankruptcy Act, it thereupon became the duty of the Interstate Commerce Commission to approve plans of reorganization for these companies or to refuse to approve any plan.

As of October 31, 1940, the Commission had approved reorganization plans involving 21 roads.[33] In addition, plans had been proposed by the examiners for 4 additional roads. The distribution of the capitalization of these 25 old companies and 24 new companies as approved by the Commission and proposed by examiners is given in Table 8 as of October 31, 1940. This table shows that for all 24 plans combined the reduction of long-term debt was slightly in excess of 47 percent, and that par value stock was reduced by nearly 47 percent, while no par shares increased in excess of 724 percent.

[32] The basic figures for all the tables appearing in the following discussion relating to reorganization plans were prepared by Mr. S. G. Spal, Jr., Statistician of the Interstate Commerce Commission, Bureau of Statistics. The writer is also indebted to Mr. Spal for various suggestions and criticisms made by him in connection with the checking of the whole study.

[33] The number of old companies was 21 but owing to the inclusion of the Boston & Providence in the New Haven plan the new companies number only 20.

TABLE 8.—*Changes in Capitalization Under Reorganization Plans Approved by the Commission or Proposed by Examiners, Oct. 31, 1940* [1]

[Debt and stock figures in thousands]

Item	Number	Long-term debt [2]	Stock		Total	
			Par value	No par shares	Par value debt and stock	No par shares
APPROVED BY COMMISSION						
Old companies	[3] 21	$2,994,494	$1,379,063	1,475.78	$4,373,557	1,475.78
New companies	[4] 20	1,593,269	706,011	12,144.64	2,299,280	12,144.64
Difference (+ or −)	−1	−1,401,225	−673,052	+10,668.86	−2,074,277	+10,668.86
Percent change (+ or −)		−46.79	−48.81	+722.93	−47.43	+722.93
PROPOSED BY EXAMINERS						
Old companies	[5] 4	82,403	46,640		129,043	
New companies	[5] 4	36,842	53,139	20.91	89,981	20.91
Difference (+ or −)		−45,561	+6,499	+20.91	−39,062	+20.91
Percent change (+ or −)		−55.29	+13.93		−30.27	
APPROVED BY COMMISSION OR PROPOSED BY EXAMINERS						
Old companies	[6] 25	3,076,897	1,425,703	1,475.78	4,502,600	1,475.78
New companies	[7] 24	1,630,111	759,150	12,165.55	2,389,261	12,165.55
Difference (+ or −)	−1	−1,446,786	−666,553	+10,689.77	−2,113,339	+10,689.77
Percent change (+ or −)		−47.02	−46.75	+724.35	−46.94	+724.35

[1] Summarized from "Change in capitalization under plans of reorganization approved by the Commission, or proposed by examiners, for railroads in reorganization proceedings before the Commission" as of Oct. 31, 1940, I. C. C., Bureau of Finance (mimeographed). This tabulation is shown in the 54th Annual Report of the Interstate Commerce Commission (1940), pp. 64–66.

[2] Includes the principal amount of certain notes and bonds which before reorganization were classified in the balance sheet as current liabilities, but which are to be funded in the plan approved or recommended. Does not include unpaid interest.

[3] Akron, C. & Y.; Boston & Providence; Chicago & E. I.; Chicago & North Western; Chicago Great Western; Chicago, M., St. P. & P.; Chicago, R. I. & P.; Chicago, S. S. & S. B.; Copper Range; Denver & R. G. W.; Erie (incl. Chicago & Erie); Kansas City, K. V. & W.; Louisiana & N. W.; Missouri Pacific; New York, N. H. & H.; Oregon, P. & E.; Reader; St. Louis-San Francisco; Savannah & Atl.; Spokane Int.; Western Pacific.

[4] Same as companies listed under Note 3 except that the Boston and Providence was included in the New Haven reorganization plan and the number of reorganized companies is 1 less than the number of old companies.

[5] Alabama, T. & N.; Fort Dodge, Des M. & S.; St. Louis Southwestern; Yosemite Valley.

[6] Same as companies listed under Notes 3 and 5.

[7] Same as Notes 4 and 5.

The analysis in the following pages has been limited to the 20 new companies for which the plans had been approved by the Commission as of October 31, 1940. All 4 roads involved in proposed plans are relatively small, the St. Louis Southwestern being the only Class I road in this group. Of the other 3 roads, 1 is an electric road and the other 2 are Class II companies.[34]

In general the new capitalizations [35] provided for by the approved plans are rather uniform, consisting of a first mortgage bond issue, one of second mortgage bonds, an issue of preferred stock, and one of common stock. For three small companies, the Copper Range; the Oregon, Pacific and Eastern; and the Reader, no long-term debt was approved. In several cases, chiefly the smaller roads, no second mortgage bonds were approved.[36] In certain other cases no preferred stock was provided for by the plans.[37] On the other hand, the Chicago, South Shore & South Bend and the Missouri Pacific have two issues of preferred stock. In one case, the Reader Railroad, no new common was authorized by the approved plan, the old common being left undisturbed.

In general the terms and conditions of the new securities of the reorganized roads exhibit rather distinct patterns. The principal terms and conditions of these securities are presented in the statistical tables and discussion in the balance of this chapter.

Terms and Conditions of Bond Issues—Kinds of Funded Debt

The new debt of the 20 reorganized companies is represented by 35 issues, of which 21 are first and 14 are second mortgage liens.[38] The total volume of this new debt, however, is divided almost equally between the first and second liens as is shown by Table 9. In

[34] Some variations from the figures shown in the foregoing table will be found in the analytical tables which follow. This is due partly to the fact that the former are based on the totals of the securities of the new companies which include certain undisturbed issues of the old companies. This analysis, however, has been based upon the securities issued by the new companies. In part also this difference is due to the fact that the figures in the preceding table are of the date October 31, 1940, and that since then there have been a number of modifications made in the plans eltber by the Commission or the courts. The latest available figures at the date the tabulations were made (late February and early March of 1941) have been used in this discussion.

[35] The summary of the approved plans contained in the tables in this chapter is confined to the new overlying securities approved. The figures do not include any securities representing underlying senior liens or equipment obligations which were left undisturbed or new divisional bonds issued in connection with the reorganization plans.

[36] Akron, Canton & Youngstown; Chicago, South Shore & South Bend; Kansas City, Kaw Valley & Western; Savannah & Atlanta; and Spokane International.

[37] Louisiana & North West; Reader; and Spokane International.

[38] In these tabulations each mortgage issue which is divided into series has been treated as a separate issue or lien because of the differences in their terms and conditions.

TABLE 9.—*First and Second Mortgage Debt of 20*[1] *Railroads Under Reorganization Plans Approved by the Interstate Commerce Commission*[2]

Lien	Issuing roads		Issues		Funded debt presently to be issued	
	Number	Percent of total	Number	Percent of total	Amount	Percent of total
First mortgage	17	85.00	21	60.00	$637,169,036	48.83
Second mortgage [3]	12	60.00	14	40.00	667,622,256	51.17
All roads	20	100.00	35	100.00	1,304,791,292	100.00

[1] Twenty-one old companies, Boston & Providence being included in the reorganized New Haven system.
[2] As of effective date of plan in accordance with the plan.
[3] Includes 1 issue of income debentures amounting to $351,730 of the Louisiana & North West R. R.

18 out of the 21 first mortgage issues representing 561.9 out of 637.2 million dollars, or 88.18 percent of the total, the interest is entirely fixed. One first-lien issue of less than 3 million dollars (Spokane International) is made contingent on earnings. For a little less than 60 million dollars of first mortgage bonds (Chicago & North Western "Series A") a combination of fixed and contingent interest was approved, 2½ percent of the 4-percent rate being fixed, and 1½ percent being contingent on earnings. The third exception to the fixed interest charge rule for first mortgage bonds is the first and general mortgage, Series "B" issue of the same road.[39] In this case not only the rate but also other terms and conditions of the issue are indeterminate, the decision being left to the discretion of the directors under the provisions of the plan. All of the second mortgage indentures authorize only income bonds, the interest on which is contingent on earnings (Table 10).

Interest Rates and Charges

The total fixed and contingent interest charges on the first mortgage bonds aggregate slightly less than 25 million dollars, of which not quite 96 percent is fixed (Table 11). The total interest charges on the second mortgage bonds, all of which are contingent upon earnings, aggregate a trifle over 30 million dollars. Roughly, therefore, the roads included in the approved plans would require a total of only 55 million dollars per annum to service both the first and second mortgage bonds. Attention is again directed, however, to the fact that these interest charges are those called for by the new debt to be issued in connection with the reorganizations and that there are in addition substantial amounts of interest represented by undisturbed prior claims and equipment obligations carried over from the old companies.

[39] The Series "B" issue, authorized in principal amount of $13,100,000, "are to be authenticated and delivered in reorganization and reserved for financing * * * a rehabilitation and improvement program" (239 I. C. C. 631).

The range of interest rates on the first mortgage bonds is rather wide—from a low of 3 percent to a high of 6 percent as compared with a range of only 4 to 5 percent on the second mortgage incomes. However, over 92 percent of all the new first mortgage debt carries a rate of 4 percent whereas slightly over 94 percent of the second mortgage debt bears one of 4½ percent (Table 11). From a practical standpoint, therefore, the rate of interest on the second mortgage income debt is roughly one-half of 1 percent higher than on the first mortgage debt.

The Income Bonds

As previously shown, the total obligations to be issued under the 14 second mortgage income indentures include a somewhat greater amount and proportion of total new debt than that represented by the 21 first mortgage issues, which are, with minor exceptions noted above, fixed interest obligations.

The greatest disadvantage of a true income bond issue has always been the fact that the bondholder does not receive any interest which is not earned in any year. This has in many cases led to the practice of attaching a cumulative provision to income bonds providing that interest not earned in any year shall accumulate. The insuperable disadvantage of this cumulative feature is the fact that actual or potential accumulation

TABLE 10.—*Interest Provisions of the Funded Debt of 20*[1] *Railroads Under Reorganization Plans Approved by the Interstate Commerce Commission*[2]

Mortgage lien	Fixed interest	Contingent interest	Fixed and contingent interest	Indeterminate interest [3]	Total
NUMBER OF ISSUES					
First	18	1	1	1	21
Second [4]		14			14
Total	18	15	1	1	35
PERCENT DISTRIBUTION					
First	85.72	4.76	4.76	4.76	100.00
Second		100.00			100.00
Total	51.43	42.85	2.86	2.86	100.00
AMOUNT OF DEBT					
First	$561,870,610	$2,846,400	$59,352,026	$13,100,000	$637,169,036
Second [4]		667,622,256			667,622,256
Total	561,870,610	670,468,656	59,352,026	13,100,000	1,304,791,292
PERCENT DISTRIBUTION					
First	88.18	0.45	9.31	2.06	100.00
Second		100.00			100.00
Total	43.06	51.39	4.55	1.00	100.00

[1] Twenty-one old companies, the Boston & Providence being included in the reorganized New Haven system.
[2] As of effective date of plan in accordance with the plan.
[3] Terms of one bond issue left to the discretion of the directors.
[4] Includes 1 issue of income debentures amounting to $351,730 of the Louisiana & North West R. R.

TABLE 11.—*Rate and Amount of Interest Charges on the Funded Debt of 20[1] Railroads Under Reorganization Plans Approved by the Interstate Commerce Commission[2]*

First mortgage					Second mortgage				
Kind of interest	No. of issues	Rate of interest	Total interest charges		Kind of interest	No. of issues	Rate of interest	Total interest charges	
			Amount	Percent of total				Amount	Percent of total
		Percent					*Percent*		
Fixed	1	3	$40,230.00	0.18	Payable if earned	1	4	$909,080.00	3.03
Do	1	3¾	1,191,731.25	5.31	do	11	4½	28,313,506.17	94.35
Do	11	4	20,735,160.40	92.35	do	[3] 2	5	785,311.50	2.62
Do	2	4½	174,285.00	.78					
Do	1	4¾	282,902.88	1.26					
Do	1	5	25,862.50	.11					
Do	1	6	1,500.00	.01					
Total fixed	18		22,451,672.03	100.00					
Contingent on earnings	1	4½	128,088.00						
Fixed and contingent	1	2½	1,483,800.65						
		1½	890,280.39						
Indeterminate	1								
Grand total	21		24,953,841.07			[3] 14		30,007,897.67	100.00
Total fixed			23,935,472.68	95.92					

[1] Twenty-one old companies, the Boston & Providence being included in the reorganized New Haven system.
[2] As of effective date of plan in accordance with plan.
[3] Includes one issue of income debentures amounting to $351,730 of the Louisiana & North West R. R.

of interest on these bonds disproportionately damage the market value of any prior securities and thus all too frequently render them unavailable for financing. Table 12 shows that all of the approved plans have attempted either partially or entirely to avoid the accumulation of interest charges on the second mortgage incomes. Three issues, representing over 113.6 millions of debt, contain no provisions whatever for the accumulation of interest charges not earned. In the remaining 11 issues the period of accumulation is limited. Eight of the issues, representing nearly 449 million, permit accumulation only to the extent of 3 years' interest; 2 allow 4 years; and 1, 5 years.

TABLE 12.—*Interest Accumulations on Second Mortgage[1] Bonds of 20[2] Railroads Under Reorganization Plans Approved by the Interstate Commerce Commission[3]*

Maximum number of years accumulations allowed[4]	Number of issues		Debt presently to be issued in reorganization	
	Number	Percent of total	Amount	Percent of total
None	3	21.43	$113,640,230	17.02
3 years	8	57.14	448,862,692	67.23
4 years	2	14.29	82,392,334	12.34
5 years	1	7.14	22,727,000	3.41
Total	14	100.00	667,622,256	100.00

[1] Includes 1 issue of income debentures amounting to $351,730 of the Louisiana & North West R. R.
[2] Twenty-one old companies, the Boston & Providence being included in the reorganized New Haven system.
[3] As of effective date of plan in accordance with plan.
[4] Sometimes expressed in the text in terms of maximum percentage accumulations.

Open and Closed Mortgages

More than one-third of the 35 new bond issues of the 20 reorganized roads and nearly half of the 21 first mortgage issues are of the closed type either at the time of issue or subsequently (Table 13). In contrast, only 3 of the 11 second mortgage income issues belong in this category. In terms of the amount of debt involved, however, a very different showing is presented. More than 94 percent of the 637.2 million new first mortgage bonds and the 667.6 million of new second mortgage bonds are neither closed at issue nor to be closed subsequently under the terms of the indentures. Moreover, that portion of the second mortgage income debt which is limited as to the total amount to be issued can be expanded only insignificantly (from $21,802,026 to $22,206,230). The corresponding $47,648,000 of first mortgage debt, most of which is composed of fixed interest obligations, however, may be more than doubled before all the issues are closed.

TABLE 13.—*Open and Closed Mortgage Bond Issues of 20[1] Railroads Under Reorganization Plans Approved by the Interstate Commerce Commission[2]*

Bonds issued under	Lien	Issues		Debt presently to be issued		Total debt limitation
		Number	Percent of total	Amount	Percent of total	
Closed mortgage	First	10	47.62	$47,648,000	7.48	$103,866,000
Open mortgage	do	11	52.38	589,521,036	92.52	
Total		21	100.00	637,169,036	100.00	103,866,000
Closed mortgage	Second	[3] 3	21.43	21,802,026	3.27	22,206,230
Open mortgage	do	11	78.57	645,820,230	96.73	
Total		14	100.00	667,622,256	100.00	22,206,230
Total closed mortgage	First and second.	13	37.14	69,450,026	5.32	126,072,230
Total open mortgage	do	22	62.86	1,235,341,266	94.68	
Grand total		35	100.00	1,304,791,292	100.00	126,072,230

[1] Twenty-one old companies, the Boston & Providence being included in the reorganized New Haven system.
[2] As of effective date of plan in accordance with the plan.
[3] Includes one issue of income debentures amounting to $351,730 of the Louisiana & North West R. R.

TABLE 14.—*Maturity Periods of Funded Debt of 20*[1] *Railroads Under Reorganization Plans Approved by the Interstate Commerce Commission*[2]

Years to maturity	First mortgage debt				Years to maturity	Second mortgage debt			
	Issues		Debt presently to be issued			Issues		Debt presently to be issued	
	No.	Percent of total	Amount	Percent of total		No.	Percent of total	Amount	Percent of total
15	1	4.76	$13,100,000	2.06	60	2	14.29	$126,547,882	18.96
17	1	4.76	5,955,850	.93	65	1	7.14	22,727,000	3.40
20	1	4.76	25,000	(3)	70	[4] 1	7.14	351,730	.05
25	3	14.29	34,820,500	5.46	75	8	57.14	460,477,737	68.97
30	1	4.76	11,159,000	1.75	100	2	14.29	57,517,907	8.62
35	1	4.76	10,000,000	1.57					
36	1	4.76	517,250	.08					
50	9	42.87	394,904,900	61.98					
55	1	4.76	74,909,775	11.76					
60	1	4.76	88,930,361	13.96					
75	1	4.76	2,846,400	.45					
Total	21	100.00	637,169,036	100.00		14	100.00	667,622,256	100.00

[1] Twenty-one old companies, the Boston & Providence being included in the reorganized New Haven system.
[2] As of effective date of plan in accordance with plan.
[3] Less than 0.01 percent.
[4] Represents income debentures of the Louisiana & North West R. R.

Term to Maturity

Table 14 shows that in general the term to maturity of the second mortgage bonds is much longer than that of the first mortgage issues. Two of the 14 second mortgage issues run for 100 years and 8 for 75 years. None of them run for less than 60 years. In contrast, only 1 of the 21 first mortgage issues runs for as long a term as 75 years. Nine run for 50 years and 6 for 25 years or less. In other words, 100 percent of both the second mortgage issues and total second mortgage debt runs for 60 years or more, whereas 19 of the 21 issues of first mortgage bonds, representing more than 85 percent of the first mortgage debt, run for less than 60 years.

TABLE 15.—*Convertibility of funded Debt of 20*[1] *Railroads Under Reorganization Plans Approved by the Interstate Commerce Commission*[2]

Type	Lien	Issues		Debt presently to be issued	
		Number	Percent of total	Amount	Percent of total
Convertible	First	None			
Unconvertible	do	19	90.48	$624,044,036	97.94
Undetermined	do	2	9.52	13,125,000	2.06
Total		21	100.00	637,169,036	100.00
Convertible	Second	9	64.29	539,184,912	80.76
Nonconvertible	do	[3] 5	35.71	128,437,344	19.24
Total		14	100.00	667,622,256	100.00
Total convertible	First and second.	9	27.27	539,184,912	41.74
Total nonconvertible	do	24	72.73	752,481,380	58.26
Grand total (excluding undetermined).		33	100.00	1,291,666,292	100.00

[1] Twenty-one old companies, the Boston & Providence being included in the reorganized New Haven system.
[2] As of effective date of plan in accordance with the plan.
[3] Includes 1 issue of income debentures amounting to $351,730 of the Louisiana & North West R. R.

Conversion Features

A little over 539 million dollars of the total new funded debt approved in reorganization plans, or less than 42 percent of the total, has been made convertible (Table 15). In this matter, however, there is a striking difference between the first- and second-mortgage issues. Nineteen of the 21 first-mortgage issues, representing practically 98 percent of the total first-mortgage bonds, are specifically nonconvertible, the matter being left undetermined in two issues representing a scant 2 percent of the total indebtedness. Nearly all of the first-mortgage debt carries fixed interest, as previously shown. On the other hand, 9 out of the 14 second-mortgage contingent-interest issues have been made convertible. As shown by Table 15, these latter issues account for more than 80 percent of the total second-mortgage contingent-interest debt.

Redemption Provisions

One of the important reasons for the lack of flexibility in the existing railroad funded debt lies in the fact that a large proportion of such debt is not subject to redemption prior to maturity. This mistake in past railroad financing has not been repeated in the approved plans. Except for 4 first mortgage bond issues, accounting for less than 20 million of indebtedness, all of both the 21 first and 14 second mortgage bond issues have been made redeemable prior to maturity and in no case at excessive premiums. Table 16 shows that the maximum redemption price fixed by the plans is 106. For most of the debt the maximum price is lower. Also in most of the issues the redemption prices are scaled downward as the term to maturity shortens, the maximum redemption price being payable

only in the first or a limited number of early years and thereafter declining to reach par at maturity.

A rather striking difference is to be noted in the size of the redemption premiums for the first and second mortgage bonds. Not quite 90 percent of the first mortgage debt carries a maximum of 105 or more whereas nearly 68 percent of second mortgage debt is redeemable at par and all of it at a maximum of 103 or lower.

Sinking Fund Provisions

In 1933 the Commission in effect announced a policy of railroad debt amortization through sinking funds.[40] Following this announcement the establishment of a sinking fund as a condition of authorizations of additional funded debt has rather consistently been required.

In line with the foregoing policy, a high proportion of both the total bond issues and the total funded debt contain sinking fund amortization requirements. Of the 35 first and second mortgage indentures, approximately three-fourths contain such provisions, and these apply to approximately the same proportion of the 1.3 billion of new funded debt under the approved plans. Table 17, which gives the details of these figures, also shows a substantial difference in the requirements of the first and second mortgage bonds with regard to this matter, although the distinction is not so pronounced as in the matter of conversion, to which attention was directed in the second preceding subsection. Thirteen of the first mortgage issues, representing nearly 62 percent of the total of 21, provide for sinking funds, but the debt represented thereby is something less than half the total first mortgage debt (48.29 percent) presently to be issued. Five issues with no sinking fund provisions whatever account for an almost equal proportion of that debt. In contrast only 1[41] of the 14 junior income issues requires no

TABLE 16.—*Maximum Redemption Prices in 21 First and 14 Second Mortgage Bond Issues of 20 Railroads*[1] *Under Reorganization Plans Approved by the Interstate Commerce Commission*[2]

Maximum redemption price	Issues		Debt	
	Number	Percent of total	Amount	Percent of total
FIRST MORTGAGE BONDS				
100	3	17.65	$19,750,000	3.18
102	2	11.76	3,673,000	.59
103	2	11.77	41,779,500	6.73
105	9	52.94	428,879,536	69.06
106	1	5.88	126,921,000	20.44
Indeterminate	17	100.00	621,003,036	100.00
	4		16,166,000	
Total	21		637,169,036	
SECOND MORTGAGE BONDS				
100	[3] 11	78.57	$452,117,371	67.72
101	1	7.14	51,422,111	7.70
101⅛	1	7.14	111,193,382	16.66
103	1	7.15	52,889,392	7.92
Total	14	100.00	667,622,256	100.00
FIRST AND SECOND MORTGAGE BONDS				
100	[3] 14	45.16	$471,867,371	36.62
101	1	3.22	51,422,111	3.99
101⅛	1	3.23	111,193,382	8.63
102	2	6.45	3,673,000	.28
103	3	9.68	94,668,892	7.35
105	9	29.03	428,879,536	33.28
106	1	3.23	126,921,000	9.85
Total	31	100.00	1,288,625,292	100.00
Indeterminate	4		16,166,000	
	35		1,304,791,292	

[1] Twenty-one old companies, the Boston and Providence being included in the reorganized New Haven system.
[2] As of effective date of plan in accordance with the plan.
[3] Includes 1 issue of income debentures amounting to $351,730 of the Louisiana & North West R. R.

[40] "* * * the indebtedness evidenced * * * is ordinarily regarded as perpetual and no provision is made for its ultimate liquidation. The result is that the funded debt of the railway companies is constantly increasing * * *.

"* * * We believe that the desired results can be obtained, in part at least, through the provision of sinking funds to be set up by the railway companies out of net income for the purpose of retiring a part of their funded debt before maturity. If such funds are not voluntarily established by the railway companies, their establishment may be required as a condition to our authorization of further bond issues under the provisions of section 20a of the Interstate Commerce Act." *Annual Report of the Interstate Commerce Commission*, 1933, pp. 25–26.

TABLE 17.—*Sinking Fund Provisions of Funded Debt for 20*[1] *Railroads Under Reorganization Plans Approved by the Inter-State Commerce Commission*[2]

Item	Issues		Debt presently to be issued	
	No.	Percent of total	Amount	Percent of total
FIRST MORTGAGE				
Issues with sinking fund provisions	13	61.91	$307,665,195	48.29
Issues with contingent sinking fund provisions	1	4.76	10,000,000	1.57
Issues with no sinking fund provisions	5	23.81	306,378,841	48.08
Indeterminate	2	9.52	13,125,000	2.06
Total	21	100.00	637,169,036	100.00
SECOND MORTGAGE				
Issues with sinking fund provisions	13	92.86	$667,270,526	99.95
Issues with contingent sinking fund provisions				
Issues with no sinking fund provisions	[3] 1	7.14	351,730	.05
Indeterminate				
Total	14	100.00	667,622,256	100.00
TOTAL FIRST AND SECOND MORTGAGE				
Issues with sinking fund provisions	26	74.29	$974,935,721	74.72
Issues with contingent sinking fund provisions	1	2.86	10,000,000	.77
Issues with no sinking fund provisions	6	17.14	306,730,571	23.51
Indeterminate	2	5.71	13,125,000	1.00
Total	35	100.00	1,304,791,292	100.00

[1] Twenty-one old companies, the Boston & Providence being included in the reorganized New Haven system.
[2] As of effective date of plan in accordance with plan.
[3] Represents income debentures of the Louisiana & North West R. R.

[41] This issue represents income debentures of the Louisiana and North West R. R.

sinking fund and the remaining 13 account for 99.95 percent of the total second mortgage obligations.

Terms and Conditions of Stock Issues—Amounts and Par Values of Preferred Stock

Seventeen of the 20 approved plans provide for the issuance of preferred stock and in 2 of these plans there are 2 issues of preferred. The total number of issues, therefore, is 19. As shown by Table 18, these consist of 17 preferred issues of 6,647,945 shares of par value stock and 2 issues aggregating 763,615 shares of no par value. No par shares, therefore, constitute a little over 10 percent of the total preferred shares. The overwhelming proportion of the par value shares is represented by 14 issues of $100 par. These account for a little less than 80 percent of the total number of preferred shares.

TABLE 18.—*Par and No Par Shares of Capital Stock of 20*[1] *Railroads Under Reorganization Plans Approved by the Interstate Commerce Commission*[2]

AMOUNT

Par value	Preferred stock			Common stock		
	No. of issues	No. of shares	Total par value	No. of issues	No. of shares	Total par value
$10	1	15,132.00	$151,320			
$40	1	383,862.50	15,354,500			
$50	1	365,747.76	18,287,388	2	372,283.42	$18,614,171
$100	14	5,883,202.70	588,320,270	2	709,278.06	70,927,806
Total	17	6,647,944.96	622,113,478	4	1,081,561.48	89,541,977
No par value	2	763,615.00		15	11,468,499.39	
Total	19	7,411,559.96	622,113,478	19	12,550,060.87	89,541,977

PERCENT DISTRIBUTION

$10	5.26	0.20	0.02			
$40	5.26	5.18	2.47			
$50	5.26	4.94	2.94	10.53	2.97	20.79
$100	73.69	79.38	94.57	10.53	5.65	79.21
Total	89.47	89.70	100.00	21.06	8.62	100.00
No par	10.53	10.30		78.94	91.38	
Total	100.00	100.00		100.00	100.00	

[1] Twenty-one old companies, the Boston & Providence being included in the reorganized New Haven system.
[2] As of effective date of plan in accordance with plan.

Earned Cumulative Preferreds

Of the 19 new preferred stocks, 10 represent a relatively new departure in the field of corporate financing in that they are earned cumulative preferred issues (Table 19). This type of security resembles a cumulative preferred in that although the time of payment is entirely discretionary with the directors the total amount to be paid is not. The difference between the two lies in the fact that whereas the contract rate of dividend fixes the payments due to cumulative preferred shareholders, the amounts earned up to a specified rate determine the payments accruing to earned cumulative preferred shareholders. Dividends earned and not paid in any year accumulate and must be liquidated before anything whatever can be paid on the junior shares under the latter type of contract.[42]

The forerunner of these issues was apparently the Pittsburgh, Youngstown and Ashtabula preferred of 1906.[43] The railroads, therefore, pioneered this type of security as they did the participating bond, the only reported issue of which was made by the Oregon Short Line Railroad Company. The former, like the latter, type of security failed to make any appreciable impression upon either railroad financiers or bankers despite the important advantages of both forms of securities from a financial management point of view. As a result, only an occasional earned cumulative[44] issue has appeared.

Table 19 shows that although a bare majority of the 19 preferred issues are of the earned cumulative type, these 10 account for nearly 5.5 million shares out of a total of a little over 7.4 million or in excess of 73 percent. In terms of the total par value issues, these stocks account for more than 71 percent of total par of the new par value preferred issues.

Of the 9 issues other than earned cumulatives, 4 noncumulatives account for almost 16 percent of the total shares.[45] Two other issues are postponed cumulative, that is, initially noncumulative but becoming fully cumulative after a few years. In 2 other issues the cumulative feature is also postponed, but in these cases the stocks are not fully cumulative but are limited as to the total amount of accumulation.

The very large volume of earned cumulative preferred stocks represented by the aforesaid 10 reorganization issues should be sufficient not only to establish the earned cumulative preferred stock as a well recognized method of financing but also to direct more general attention to the very substantial advantages which this type of share possesses over either fully cumulative or noncumulative issues.[46]

[42] Cf. W. H. S. Stevens, "Rights of Non-Cumulative Preferred Stockholders," 34 *Columbia Law Review* 1459 (1934).

[43] "* * * 3. Provided, that, if for any dividend period, the net profits of the Company shall not amount to a sum sufficient to pay dividends on the Preferred Stock, as above provided, in whole or in part, for the reason that the Directors have, by specific resolutions, applied said net profits to benefiting the financial condition of the Company, or to the improvement or extension of its property, then, and in such case, the amount so applied shall be considered applicable to a deferred dividend on the Preferred Stock for the period in default, before any dividend is declared in favor of the Common Stock." *Ibid.*, p. 1459, Note 59. No earlier issue has been found by this writer though there may quite possibly have been others.

[44] Issues of earned cumulative preferreds have been listed on the New York Stock Exchange by United Stores (Class A), Essex Cotton Mills (2d), Mullins Manufacturing Corp., and Pressed Steel Car Co. (2d).

[45] Almost all of the earlier railroad issues, so far as one can judge from New York Stock Exchange listings, were noncumulative.

[46] For detailed analysis and comparison of the advantages and disadvantages of different types of preferred stocks see Stevens, op. cit., 34 *Columbia Law Review* 1460–1461, and "The Discretion of Directors in the Distribution of Noncumulative Preferred Dividends," 24 *Georgetown Law Journal* 393–396.

TABLE 19.—*Cumulative and Noncumulative Features of Preferred Stocks of 20 [1] Railroads Under Reorganization Plans Approved by the Interstate Commerce Commission [2]*

Type of stock	Issues		Shares		Par value stock			
					Shares		Par value	
	No.	Percent of total	Number	Percent of total	Number	Percent of total	Amount	Percent of total
Postponed fully cumulative [3]	2	10.53	34,628.00	0.47	34,628.00	0.52	$3,462,800	0.56
Postponed limited cumulative [4]	2	10.53	755,760.99	10.20	755,760.99	11.37	57,288,711	9.21
Limited cumulative [5]	1	5.26	15,132.00	.20	15,132.00	.23	151,320	.02
Earned cumulative [6]	10	52.63	5,429,514.51	73.26	4,666,399.51	70.19	443,608,201	71.31
Noncumulative [7]	4	21.05	1,176,524.46	15.87	1,176,024.46	17.69	117,602,446	18.90
Total	19	100.00	7,411,559.96	100.00	6,647,944.96	100.00	622,113,478	100.00

[1] Twenty-one old companies, the Boston & Providence being included in the reorganized New Haven system
[2] As of effective date of plan in accordance with plan.
[3] One issue, representing 22,038 shares of $2,203,800 par value, is cumulative, if earned and not paid, to the extent of $15 per share and becomes fully cumulative when additions to surplus after reorganization shall have increased that account by $1,101,900; the other issue, representing 12,590 shares of $1,259,000 par value, is an earned cumulative for the first 3 years.
[4] One issue, representing 365,747.76 shares of $18,287,388 par value becomes an earned cumulative 3 years after the effective date of plan of reorganization, the maximum accumulations being limited to 15 percent; the other issue, representing 390,013.23 shares of $39,001,323 par value, is an earned cumulative during the first 4 years after the effective date of the plan, after which time it becomes fully cumulative, the maximum accumulations being limited to 15 percent.
[5] Accumulations limited to a maximum of 25 percent.
[6] Dividends earned and not paid accumulative to the extent they are earned and must be liquidated before any dividends can be paid on the common.
[7] Dividends do not accumulate, whether earned or not.

Participating Preferreds

A minority of the preferred issues have followed the excellent precedent set by numerous early railroad issues in providing for participation in profits in addition to the fixed initial dividends on the preferred stock.[47] Table 20 shows that over 35 percent of the total preferred shares are entitled to some participation in profits over and above their fixed initial preferred dividends. In the case of par value preferred issues the corresponding percentage is over 42 percent of the total par value of such issues.

Of the 19 preferred issues, 16 carry dividend rates of 5 percent, 1 a rate of 6½ percent, while 2 no-par-value issues carry a dividend rate of $5 per share.

Common Stock

The most striking difference between the preferred- and common-stock issues in the approved reorganization plans is found in their respective use of the par-value and no-par forms. Table 18 shows that almost 90 percent of the more than 7.4 million preferred shares are par-value securities, whereas over 91 percent of the 12.55 million common shares are in the no-par form. There is a similar situation with regard to the number of issues involved. Almost 90 percent of the preferred issues are par value and nearly 79 percent of the common issues, no par. Of the 4 par-value common issues, 2 are $100 par and 2 are $50.

[47] Out of the 147 railroad preferreds listed on the New York Stock Exchange in the 50 years 1885–1934 a total of 35, or 23.8 percent, were entitled to additional participations above fixed initial dividends. This is a considerably higher proportion of the railroad total than is shown by either utility or industrial preferreds. Cf. Table II, W. H. S. Stevens, "Stockholders' Participations in Profits," 9 *Journal of Business of the University of Chicago* 211.

The Future

Possible Long-Term Seriousness of Railroad Situation

It is possible to take the view that the increased business and especially the increased financial risk in railway enterprises are more or less transient conditions which will ultimately correct themselves. A sharp reduction in both these types of risks at least

TABLE 20.—*Participation in Profits of 19 Preferred Stocks Under 20 [1] Railroad Reorganization Plans Approved by the Interstate Commerce Commission [2]*

Fixed initial dividend rate [3]	Issues		Total shares			
			Number		Par value	
	Number	Percent of total	Number	Percent of total	Amount	Percent of total
5 percent	16	84.21	6,628,468.96	89.44	$620,165,878	99.69
6½ percent	1	5.26	19,476.00	.26	1,947,600	.31
Total	17	89.47	6,647,944.96	89.70	622,133,478	100.00
$5 per share	2	10.54	763,615.00	10.30		
Grand total	19	100.00	7,411,559.96	100.00		

Fixed initial dividend rate [3]	Participating in addition to fixed initial dividends					
	Issues		Number of shares		Par value	
	Number	Percent of total	Number	Percent of total	Amount	Percent of total
5 percent	4	66.67	2,596,686.77	99.24	$259,668,677	99.26
6½ percent	1	16.66	19,476.00	.74	1,947,600	.74
Total	5	83.33	2,616,162.77	99.98	261,616,277	100.00
$5 per share	1	16.67	500.00	.02		
Grand total	6	100.00	2,616,662.77	100.00		

[1] Twenty-one old companies, the Boston & Providence being included in the reorganized New Haven system.
[2] As of effective date of plan in accordance with plan.
[3] May be fully cumulative, limited cumulative, earned cumulative, or noncumulative.

temporarily is already under way as a result of the defense and war programs. All of the available information at this writing indicates definitely that this is likely to continue for some time—perhaps years. The theory that the forces of economic change which have been operating so adversely to the railroads would reverse themselves was even advanced by the Interstate Commerce Commission at an early stage of the depression.

When business conditions begin to improve, railroad traffic and earnings will improve in harmony with them, just as they have in the past. And as stated in the report, while the tide may be slow in turning, there is no more reason for thinking that business will not improve than there was in 1928 for thinking that depressions were a thing of the past and that the country had entered an era of permanent prosperity. Too much weight ought not to be attached, therefore, to the present discouragement of investors. When railroad earnings take a sharp turn upward, as in due time they will, railroad credit will also rise.[48]

Moreover, the situation with regard to receiverships and trusteeships was, on the whole, not much worse at the depth of the depression of the 1930's than at that of the 1890's. This is indicated by Table 21. There was, however, a radical difference in the position of the railroads in the 1890's and the 1930's. In the former period and for some decades subsequently, the railroads possessed a substantially monopolistic position in the transportation of passengers and freight.[49] At the present time they have been and are being relegated to the position of a losing competitor for many classes of traffic even though retaining, at least for the present, a dominating position considered from the standpoint of traffic as a whole. As the Commission further pointed out in the report just quoted:

* * * The railroads face new conditions which will compel changes in methods of operation, manner of service, and price policies, and which can not be met successfully in all respects by reliance upon methods and policies which were serviceable and became established under more nearly monopolistic conditions. The situation is one which frequently confronts private, competitive industries, and they have become accustomed to such readjustments by force of necessity. It is different with the railroads, but there are many indications that they now realize the necessity for more or less radical readjustments and are preparing to act accordingly. We have confidence in their ability to rise to the needs of the occasion.[50]

The severity of the existing and potential competition among transport agencies, the end of which is not yet in sight, therefore, raises in acute form the question of whether in the long-run rail transport can

TABLE 21.—*Miles of Road and Capitalization of Railroad Companies in Hands of Receivers and Trustees, 1894 and 1938*

[Including switching and terminal companies]

Item	Year ended June 30, 1894	Year ended Dec. 31, 1938
Miles of road owned, all railways	171,505	236,842
Miles of road operated, all railways	[1] 175,691	249,826
Capitalization, all railways	$10,190,658,678	[2] $22,738,025,729
In receivership or trusteeship:		
Miles of road operated	40,819	77,019
Capitalization	[3] $2,500,000,000	[4] $5,255,590,691 [5] $5,930,796,204
Percent of all railways:		
Miles of road operated	23.23	30.83
Capitalization	24.53	[4] 23.11 [5] 26.08

[1] Excludes 3,000-odd miles of road operated for which reports are not included in the *Statistics of Railways in the United States* (1894).

[2] Excludes circular and unofficial roads. Excludes securities nominally issued or nominally outstanding.

[3] This figure is given in round numbers in the text of the Statistics of Railways for 1894. The exact figure is not available except by tabulation of the individual road reports.

[4] Capital stock plus unmatured funded debt. Excludes securities nominally issued or nominally outstanding because these figures are not available except by a special tabulation. It is believed that if these figures were included, the ratio of the capitalization of the roads in receivership to the capitalization of all roads would be about the same as the ratio shown above.

[5] Capital stock plus matured and unmatured funded debt. Excludes securities nominally issued or nominally outstanding because these figures are not available except by a special tabulation. It is believed that if the figures were included, the ratio of the capitalization of the roads in receivership to the capitalization of all roads would be about the same as the ratio shown above.

Source: I. C. C., *Statistics of Railways in the United States*, 1894 and 1938.

be expected greatly to improve its present position with regard to traffic volume or whether it must anticipate further relative or even absolute long term declines in traffic. The possibility that the roads, despite the earlier defense and present war time increases in tonnages, may experience further continued inroads upon their business is not a pleasant prospect to contemplate.

In any case the continued seriousness of the railroad situation over the last decade and the possibility of further relative or even absolute traffic losses over the longer term would seem to argue that some effort should be made to fortify the investment position of the railroads by reducing the financial risk factor. This may be done by such revisions of the terms and conditions of funded debt as will render interest charges flexible enough to respond more or less automatically to the impact of the forces represented by economic change.

For the better part of two decades[51] economic and technological changes have been subjecting railroad earning power to increasingly greater fluctuations and uncertainties. If, as conceivably may be the case, the railroads continue to lose traffic to competing transportation agencies, the reductions of funded debt accomplished and being accomplished through the approved reorganization plans may well prove to be none too high and even in some cases, perhaps, not sufficiently drastic. Moreover, the unpleasant fact must be faced that continued further losses in traffic volume over the longer term may, at some future date, force into the

[48] *Forty-fifth Annual Report of the Interstate Commerce Commission*, 1931, p. 115.

[49] Although the rail carriers had encountered considerable water competition, there was little or no indication at that time that these water carriers could or would seriously affect the dominating position attained by the railroads.

[50] *Forty-fifth Annual Report of the Interstate Commerce Commission*, p. 117.

[51] Losses of passenger traffic to private automobiles and busses and of certain classes of freight to the trucks were in evidence long before 1930.

hands of receivers and trustees a number of solvent roads which have weathered the present depression. Even during the comparatively good year of 1940 (at least as measured by the standards of the 1930's) 18 of the 96 solvent Class I railways did not have sufficient income available to meet their fixed charges.[52]

Need for an Elastic Debt Structure

Income Bonds and Debt Elasticity

Recognition of these conditions lays the foundation for the opinion just expressed that the railroad funded debt structure should be made more elastic.[53] Up to the present time practically all obligations with interest charges dependent or contingent upon earnings have been in the form of income bonds. The chief objection to this form of obligation has already been pointed out above; in its pure form the bondholder loses his interest to the extent it is not earned in any year. It was also pointed out in the preceding discussion that this had led to the practice of making such obligations cumulative and that the effect of such a provision was injurious to junior security values because of actual or even prospective accumulations. Table 12 in connection with that discussion shows that the approved plans apparently attempted to avoid this result by making a few of the incomes noncumulative and limiting the accumulations on the remainder to a 3- to 5-year period.

While this limitation of accumulation to a comparatively brief period of years may be desirable, the influence of the possibility of any accumulation is damaging to preferred and common stock values and impairs the ability of the corporation to finance with stock.[54] Moreover, it is by no means certain that the limited accumulation provided for by the approved plans is actually as limited as it appears to be. If we assume the 3-year accumulation limitation, for example, and no earnings on the income bonds for 7 years, there will then be only 3 years of accumulations under the terms of the contract. But if thereafter earnings rise to a point where 1 year's accumulations can be paid off, will there not still be 3 years of accumulated interest charges ahead of the preferred stock?[55]

Although this type of provision will not, therefore, create as large an apparent volume of accumulated interest as would a fully cumulative issue, the possible effect on junior financing may not be radically different. The par value provisions of the preferred stock issues do not lend themselves especially well to stock financing. The accumulative provision for the income bonds, limited though it is, tends to accentuate further the difficulties of stock financing. This suggests the theory that the cumulative features of the incomes might have been entirely eliminated and participating provisions substituted therefor.

Participating Bonds and Debt Elasticity

Apparently only one instance of a participating bond issue is known to American finance, the Oregon Short Line 4's of 1903 redeemed in 1905. Yet the principle of divisibility of earnings involved in such a participating issue not only differentiates it in a significant and important way from the income bond but renders it definitely more desirable than the latter. Up to the nominal interest rate the income bond absorbs all the earnings in each year. The participating obligation, on the other hand, makes only a part of the earnings available for interest up to the nominal rate, the balance of such earnings accruing to junior creditors or other security holders regardless of whether those earnings are large or small. Whether the income bonds permit any earnings to accrue to junior security holders, on the other hand, depends entirely upon the size of those earnings. As a result, the value of securities junior to participating bonds should ordinarily be

[52] This statement is based upon a compilation made from the annual reports filed with the Interstate Commerce Commission.

[53] "Actual and potential economic and technological changes and the resulting fluctuations and uncertainties with regard to earning power point to two conclusions. These are that the fixed-interest-debt policies of the railroads are largely obsolete and that greater flexibility with regard to annual interest payments is desirable. There is no magic in the fixity of rate of interest. Interest requirements can be met only from earnings. If there are not sufficient earnings the fixity of the interest rate offers no salvation to the investor. Indeed, its effect in many cases will be merely to further impoverish the company before it passes into the control of receivers or trustees. The main reliance of railroads for future borrowing therefore should be upon obligations where interest is dependent wholly or in part on the earning power, such debt to be given a comprehensive mortgage upon the property without prior fixed-interest bonds, or subject only to a limited amount of such fixed-interest debt." (Miller, Commissioner, dissenting in part, *Chicago, Rock Island and Pacific Railway Company Reorganization*, 242 I. C. C. 298, 473–474. Cf. also W. H. S. Stevens, "Participating Debt Versus Other Securities in Capital Structure Readjustments," 28 *Georgetown Law Journal*, 1021, 1040–1041.)

[54] "Moreover, the possibility of accumulation of unpaid interest on the new adjustment bonds after 1930 may make still more remote the possibility of stock financing." (*C., M. & St. P. Co. Reorganization*, 131 I. C. C. 694.)

[55] "* * * *provided, however,* that whenever the accumulated unpaid interest on this Bond shall equal 13½% of said principal sum, such interest shall cease to accumulate *unless and until subsequent payments of accumulated unpaid interest shall reduce such accumulated unpaid interest below 13½% of said principal sum.* In the case of each Bond, any accumulated unpaid interest shall be payable, without interest thereon, on the next succeeding interest payment date or dates when and to the extent that said defined income of the Railway Company for the calendar year preceding any such interest payment date shall be sufficient to make payment of the accumulated unpaid interest, or some part thereof, on all Bonds issued and outstanding on the preceding December 31st, and shall be paid in full prior to making the payment of interest then due on the Bonds with respect to such preceding calendar year: *Provided, however,* That such accumulated unpaid interest shall be payable unconditionally at the maturity of said Bond whether by its terms, by call for redemption, by declaration, or otherwise. * * *" General Income Mortgage of Chicago Great Western Railway Company to The First National Bank of Chicago, Trustee, dated as of January 1, 1938, p. 5. [Italics supplied except "provided, however."]

better maintained than those junior to income bonds, particularly in years of relatively poor earnings.

In a pure participating obligation, interest would be payable at whatever rate was represented by a specified fixed proportion of the total earnings of each year—a pure profit sharing arrangement.[56]

Practically, of course, it is most unlikely that a participating obligation representing any such outright profit sharing would ever be used. For one thing it would probably be extremely objectionable to common stockholders. These are even less inclined to concede to bondholders than to preferred stockholders any rights to profits involving even a potential possibility of large gains. It would accord better with the usual temper of common stockholders, as well as with the customary fixed interest convention, therefore, to provide that the bondholders' share of the profits would be applicable first to interest charges for the year up to some nominal rate of interest specified in the contract. Any excess of the amount of the participation over and above this nominal rate would then be used to pay the back interest, if any, to the extent that it had not been paid at the nominal rate in prior years. The balance of the bondholders' share, if any, would then revert to the junior security holders in addition to their initial participation.

In this form the participating obligation would adjust interest charges more or less automatically to earning capacity and the bondholder would be protected against the loss of interest in years of little or no earnings out of his larger participations in the more prosperous years. Although partaking of the characteristics of an income bond, this form of security would still be fundamentally a participating bond. Neither the current interest at the nominal rate nor any back interest is payable except out of some predetermined fraction of the income available after the payment of operating expenses and any prior charges in any year.

But neither a pure participating obligation nor the modification just suggested will meet another important criticism of both as compared with either fixed interest or purely income obligations. This very fundamental objection is that the terms of these two participating forms of obligation greatly reduce the earnings coverage for interest charges as compared with either of the latter. A company with $100,000 of income available for fixed or income interest charges of $50,000, for example, shows a coverage of twice those charges. If we assume that a participating obligation entitled to a 50 percent share of the $100,000 available earnings were substituted, the income available for interest charges would be only $50,000, or a coverage of only once those charges, the remaining $50,000 going to the junior security holders.

The foregoing leads to the conclusion that the type of bonds best adapted to the uncertainties of the railroad situation would be a combination of a noncumulative income obligation with participating provisions applicable only to the unearned and unpaid interest of prior years.[57] This form of obligation renders the earnings coverage of interest charges equally as high as those for the fixed interest or usual income obligation. Also by limiting the total interest payable in terms of the annual nominal rate specified, it meets the possible stockholder objection of a too favorable treatment of the bondholders. Finally, as previously pointed out above, it offers bondholders the possibility of recovering the unearned interest of prior years out of the larger earnings of later ones. The bondholder thus obtains protection for his interest charges with less sacrifice of junior security values than is obtainable through cumulative income bonds.

Conclusion

Both the business and financial risks of railroad enterprises have been increasing ever since the first decade of the century; the former in no small part as a result of an extraordinarily increasing tax burden, the latter from a combination of this increasing business risk with a growing volume of interest charges. The competition of other types of carriers and the depression beginning in 1930 produced together so radical an increase in business risk that many roads were unable to meet their interest charges and passed into the hands of receivers and trustees.

Whether or not the Section 77 reorganizations of these roads were drastic enough to protect them against the forces of economic change, it is obviously impossible to say. It is difficult, however, to believe that the present tide of prosperity will continue indefinitely. If it does not, the future of the reorganized as well as other roads will probably be determined largely by whether the traffic losses of the railroads to competing types of carriers continue. Should this diversion increase, railroad investors must probably be prepared

[56] As our experience with participating obligations is so limited, the possible type characteristics of these obligations must be drawn largely from the terms of so-called participating preferred stocks. Obviously there are a variety of possible forms of participating obligations in addition to those mentioned here. Cf. W. H. S. Stevens, *op. cit.*, 9 *Journal of Business of the University of Chicago*, 114 and 210.

[57] For example, "the indenture would provide that the bondholders shall be entitled to interest to the extent earned in each year up to, say, four per cent and in addition to so much of five per cent of the earnings of each year after the payment of the said four per cent income interest as may be necessary to equal a rate of four per cent in each and every preceding year in which such rate of four per cent shall not have been paid." Stevens, op. cit., 28 *Georgetown Law Journal*, 1038.

of common characteristics. Hence an assumption underlying the analysis that follows is that extensions of control, in the transport field as elsewhere, require positive justification. A fair promise should be present that better service, or service at lower cost, will result.

Changing Philosophy of Regulation

Even a brief review of the evolution of the motivating forces, scope, and character of transport regulation reveals that our present concept is strikingly different from that applied prior to 1920.

Conceptually, at least, economic regulation in this country has been geared to mesh with basic American institutions such as private property, a relatively free enterprise, and the private profit system. However, it is difficult to generalize about the reasons for imposing special regulatory interferences upon certain industries. The reason most commonly advanced has been the exercise of private monopoly power in socially significant industries in ways adverse to the public interest. But today regulation frequently comprehends highly competitive industries as well, for example, the trucking industry. The most accurate generalization that can be made is that the touchstone for regulation has been the existence of troublesome conditions.

Most of our transport control has consisted of two main types: (1) Price regulation to assure reasonable and nondiscriminatory rates, and (2) controls and standards of various kinds to maintain competition. These bulwark controls have lately been augmented by regulation of entry and minimum rates to assist or control the process of adjustment of supply to demand, under a general standard of promoting a more adequate system of transportation in terms of the needs of our commerce, our Postal Service, and national defense. Hence by our regulatory process we have been seeking essentially economic ends. Some noneconomic objectives have also been sought, but lack of adequate statutory definition makes it extremely difficult to state these in concrete terms.

Period of Early State and Federal Regulation

The presence of common elements in each period makes arbitrary any attempt to define periods of essentially different schemes of transport regulation. Yet the designation of rough breaking points in motivation, scope, and the essential tasks of regulation will throw into clearer relief changing features of importance to this discussion. The breakdown selected for this purpose is: (1) The period of early State and Federal regulation, roughly 1870 to 1920; (2) the post-World War readjustment period, 1920–33; and (3) the present period of extension of regulation over the entire transport market, 1933 to date.

In the early period regulation applied primarily to the railroads, to a minor extent to water carriers,[3] and, after the Hepburn Act of 1906, to pipe lines.[4] The numerous monopolistic sectors in the transport market of this time were plainly visible as well as significant in terms of market functioning. Only a few railways were available at the larger centers, and these places constituted a small proportion of the total number of shipping points served by any given line. The remaining communities generally had no alternative rail service. Water lines offered alternative services in limited areas and for some commodities only. Consequently, even though vigorous interline competition frequently broke out and interagency competition with water carriers prevailed for traffic moving between centers having alternative services,[5] monopolistic conditions, limited somewhat by interregional competition of producing areas and markets, generally obtained on the traffic between, and to and from intermediate points.

The strong wave of popular resentment against the railroads that spread among shippers and communities after the Civil War was fed by three results of relatively free enterprise under these conditions. First, rates were frequently excessive; and flagrant discrimination between large and small shippers, competitive and noncompetitive points, and types of traffic was common. Second, between competitive points railroads tended to organize pools and make rate agreements or acquire common financial interest in order to avoid sporadic rate wars and to curb price competition. Third, the railroads frequently sought, sometimes successfully, to destroy water lines as competitors by rate cutting for which their large pools of revenues from extensive and, in part, noncompetitive operations, and their higher ratios of overhead cost gave them the advantage.

Shipper groups, whose complaints were most spectacularly voiced by the Granger Movement, pressed hard for protection from railroad abuses by means of stronger regulation in both the State and Federal spheres. They particularly wanted governmental regulatory action to curb undue discrimination [6] and to place upper limits to high rates, but they also sought to prevent pooling and other monopolistic practices. In passing the Act to

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[3] The Act to Regulate Commerce of 1887 covered common carriers "engaged in * * * transportation * * * wholly by railroad, or partly by railroad and partly by water when both are used under a common control, management, or arrangement, for a continuous carriage or shipment."

[4] It may be noted, however, that Pennsylvania initiated some regulation of common carriers by motor vehicle in 1914 and eleven States and the District of Columbia were doing likewise by 1920.

[5] Cf. Part I, Section I, 1, this report.

[6] In 1886 the Cullom Committee stated the essence of these complaints as follows: "It will be observed that the most important, and in fact nearly all, of the foregoing complaints are based upon the practice of discrimination in one form or another This is the principal cause of

Regulate Commerce [7] of 1887 in response to such agitation, Congress very definitely rejected the railroad contention that arbitrary rates could not be maintained while there was competition from other lines and water routes. It is important to note also that Congress rejected the principle, urged by the railroads before the Cullom Committee, that any regulation should give some protection to their stockholders. While the Act may have lessened indirectly any destructive competition in the railroad industry, and thereby may have given the railroads some protection, scant evidence of any kind exists that Congress had an intention of seeking to promote the financial welfare of the railroads by this regulatory policy.[8] Control of destructive competition to improve carrier earnings is a development of a later date.

The main tasks assigned Federal regulation initially were to protect shippers and communities directly from unjustly discriminating and unreasonably high rates and indirectly from further impairment of interline and interagency competition. The chief means relied upon to accomplish this shipper protection were publicity and court action. The Commission was empowered to investigate whether railroad rates and practices were in conformance with the broad standards of reasonableness and equality provided in the Act and to publicize its findings. Litigation of individual cases was necessary to obtain compliance, if a carrier ignored a finding that certain rates or service practices were unlawful. While this procedure considerably strengthened the position of the shipper, the delays and cost involved and the limitation of any obtainable relief to the specific case under litigation rendered it very unsatisfactory.[9]

The legislative amendments of 1906 and 1910 strengthening the powers of the Commission largely surmounted the prominent difficulties encountered by the Commission and shippers in obtaining the anticipated benefits of regulation.[10] Yet these and other amendments before 1920 still reflected no positive concern for the interests of the regulated carriers.[11]

While rate controls were a primary feature of early regulation, public policy also sought in numerous ways to enforce more effective competition in transportation.[12] From the beginning, Section 5 of the Act prohibited all forms of railroad pooling.[13] Moreover, the Mann-Elkins Act of 1910 placed a restraint upon rate cutting by railroads, which was designed to eliminate water carriers as vigorous competitors; for after reducing their rates for this purpose, railroads were permitted to raise them only when justified by changed conditions other than elimination of water competition. The Panama Canal Act of 1912 sought to preserve competition by prohibiting railroad ownership or control (with some exceptions) of actually or potentially competitive water lines. It also safeguarded water carriers by empowering the Commission to establish through routes and maximum joint rates and physical interconnections between rail and water facilities. Irrespective of whether Congress originally intended to except railroads, the Sherman Anti-trust Act was also applied to rate agreements [14] and railroad combinations.

To sum up, the principal characteristic of regulation in this period was its almost exclusive consumer motivation, with its concept of equal treatment among shippers and areas. Consumers were to be protected first

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complaint against the management and operation of the transportation system of the United States * * *". 49th Cong., 1st sess., S. Rep. 46, Pt. 1 (1885–86), p. 182. Earlier investigations had stressed extortionate rates to a greater extent, in part because of a drastic decline in farm prices relative to freight rates in the post-Civil War period.

[7] Cf. Part I, Section I, 1, of this report, for a summary of public agitation for regulation and a brief sketch of the State and Federal response to public criticism of the railroads.

[8] The following statement from the *Second Annual Report of the Interstate Commerce Commission* (1888), p. 21, is instructive: "The statute, in its requirement of reasonable and just rates, has had in view the protection of the public from extortion and from unfair discriminations. *It does not assume that railroad companies will need protection against their rates being made unreasonably low, and it has not conferred upon the Commission any power to order an increase of rates which it can see are not remunerative.* In general, therefore, it may be said that railroad managers possess the power to destroy the interests not only of their rivals, but of their own stockholders, if they will recklessly make rates that lead to bankruptcy." [Italics supplied.]

[9] At first the Commission acted on the assumption that it had power to prescribe reasonable maximum rates for the future to replace those found unlawful. But this interpretation was rejected by the Supreme Court in 1896. *Cincinnati, New Orleans and Texas Pacific Ry. Co.* v. *Interstate Commerce Commission*, 162 U. S. 184 (1896), and *Interstate Commerce Commission* v. *Cincinnati, New Orleans and Texas Pacific Ry. Co.*, 167 U. S. 479 (1897).

[10] The maximum rate power was granted by the Hepburn Act of 1906 and power to suspend and investigate proposed changes in rate schedules was bestowed by the Mann-Elkins Act of 1910. The latter amendment also tightened section 4 by eliminating interrailroad competition as a dissimilar circumstance justifying long-and-short-haul discrimination.

[11] The Elkins Act of 1903 may be an exception to the rule that early regulation was motivated by a desire to give shippers greater safeguards. The carriers joined the sponsors of this amendment, which made the railway corporation liable for unlawful discrimination and concessions and any receiver of rebates guilty of violating the law. By increasing the penalties for departing from filed rates, this Act may incidentally have aided the carriers by restricting rate cutting.

[12] According to Charles L. Dearing, "Before 1920 the chief concern of the Federal Government was with the statutory enforcement of a thorough-going interline railroad competition and with the maintenance of effective competition between water and rail carriers." Lyon, Abramson and Associates, *Government and Economic Life*, vol. II, p. 766.

[13] However, the carriers continued to arrange rate schedules by joint agreement. The virtual necessity of some form of group action on rates to satisfy the rate-filing requirements has led one writer to characterize this aspect as inconsistent with the general scheme of enforcing independent, competitive railway action. *Ibid.*, pp. 768, 796.

[14] The Supreme Court ruled that railroad-rate agreements are illegal in *United States* v. *Trans-Missouri Freight Association*, 166 U. S. 290 (1897), and in *United States* v. *Joint Traffic Association*, 171 U. S. 505 (1898). Still applicable, the anti-trust prohibitions have not been actively enforced against contemporary railroad rate-making activities, nor against rate bureau agreements in the more naturally competitive motor carrier industry. This situation may change in the future, for the Antitrust Division of the Department of Justice has recently announced a broad program of anti-trust law enforcement covering all agencies of transport.

and foremost by correction of outstanding abuses of private monopoly power; and, second, by preservation of interline and interagency competition to prevent growth of monopolistic elements in the transport market. It was recognized that competition was not serviceable as the only market regulator in the railroad industry, yet the public was unwilling to place its faith solely in public control. Though the original powers proved weak and means were found to impair railroad competition, public policy in this period had the virtue of simplicity and consistency both in terms of basic philosophy and the administrative problem. The tangle so evident in current policy of trying to protect and foster carrier and consumer interests at the same time was avoided. Moreover, the enormously difficult task of directing to a considerable extent the development and management of the entire transport system by positive price-control standards, entry limitation, and other regulatory devices of today was not attempted. It was assumed that earnings of private enterprise would be sufficient to draw capital into the railroad industry adequate to insure continuous and dependable service. With sources of such competition as existed safeguarded and monopolistic rate and service abuses curbed, rate-making and investment decisions could be left in the hands of the carrier. Nor was there a legislative intent to restrict competition, except in the case of rail activities seeking to eliminate water carriers as competitors.[15]

The Post-World War Adjustment Period

Marked changes in both the character and degree of regulation accompanied the return of the railroads to private control after the World War. The Transportation Act of 1920 is notable for introducing carrier protection as an objective of regulation and for giving policy a promotional and positive task to perform. The new philosophy of control placed emphasis upon sufficient earnings to the carriers in order to insure adequate and efficient service under private ownership. Though this change represented a distinct innovation in regulatory legislation, recognition had earlier been given to sufficient earnings to the carriers by the courts in cases involving alleged confiscation of carrier property without due process of law and by the Commission in observing such constitutional safeguards.

These innovations grafted upon earlier regulatory policy had their root in a growing dissatisfaction after 1910 with some of the results of enforced competition and negative regulation.[16] Seasonal car shortages and regulatory hindrances to advancing rail rates to meet increased costs from a rising price level contributed to a growing attitude that rate regulation should give positive consideration to the carriers' need for additional revenue. But a more immediate reason lay in impaired railroad credit after the World War. Of importance, too, were the lessons learned by operating the many competing railroads as a more unified system during Federal control.[17] All factors seemed to point to regulatory action to improve railroad credit and to streamline and strengthen the system as a whole.

Rate controls became the leading instrument for encouraging investment and an adequate supply of railroad facilities. The Commission was directed by the new rule of rate making[18] to initiate or modify rates with specific (but not exclusive) regard for the adequacy of net railway operating income for carriers as a whole or in suitable groups. Thus the Commission was given direct responsibility for a positive exercise of the maximum-rate power. To prevent rate competition from undermining the adequate income sought for the railroads,[19] the Commission was given the minimum rate power for the first time. Henceforth, exact rates could also be prescribed.

The introduction of a system of supervised cooperative action by carriers also represented a sharp break with earlier regulatory policy. With Commission approval, acquisition of control, voluntary consolidation of independent railroads, and pooling were encouraged. Moreover, Congress directed the Commission to prepare a plan for consolidation, and granted it power to control construction of new lines and abandonment.[20] Control of securities issuance and stronger powers over service were also given the Commission. In theory these new powers would enable the Commission to promote the development of an economical plant.

Whether the solutions expressed in the Transportation Act of 1920 should be viewed as provisional policy to meet an emergency railroad credit and supply situ-

[15] It is noteworthy that Congress did not bestow the minimum-rate power in this period, although recommended by the Commission as early as 1893. Cf. *Seventh Annual Report of the I. C. C.* (1893), p. 78. By 1904 the Commission had discontinued its recommendation as to the minimum-rate power, which was not revived until 1919. Nor did Congress respond to the early suggestion of the Commission that fuller regulation of water carriers be enacted in order to control rail-water competition more effectively. The competitive pressure of the water carrier upon rail rates was not to be restricted as was that of the more powerful rails upon the water carriers.

[16] Cf. Edgar J. Rich, "The Transportation Act of 1920," *American Economic Review*, vol. X, No. 3, September 1920, pp. 507–527.

[17] Cf. Part I, Section I, 1, this report.

[18] Cf. Part I, Section III, 1, this report, for a discussion of the actions taken and problems encountered in giving effect to this standard.

[19] *Ibid.*, for an account of policies and extent of exercise of the minimum rate power over rail rates.

[20] Direct control of this kind over supply came after most of the development of railroad plant had taken place. Cf. Part I, Section I, 1, this report.

ation in an inevitable post-war readjustment period or as evidence of an emerging attitude that regulated monopoly should be fostered in preference to enforced competition is a puzzle not easy to unravel. Yet it is clear that a more comprehensive regulatory structure and a new philosophy of positive control had emerged. Even though greater restriction of managerial prerogatives was now possible, the railroads were active supporters of the Act. The probable reasons for this reversal in their traditional opposition to regulation were that little additional direct implementation of the shipper interest was involved and the possibility of financial gains was implicit in a thory of control which sought to promote adequate service for the public by fostering carrier welfare, too.

By 1920, then, a more significant and much more difficult role had been assigned economic regulation. It had to protect both shippers and carriers. It had to assist other kinds of public action and private enterprise to provide adequate transportation in terms of more uniformity of service and rates, fewer breakdowns in service in periods of peak demand, and greater economy. It had to plan and work toward reorganizing railroad plant and systems developed under a regime of governmental aid and great freedom for private enterprise. These complex tasks demanded a different kind of knowledge and judgment, bordering closely upon that required of sucessful entrepreneurship. A belief that Government should assume greater responsibility for the railroad system was the basis for attempting these economic functions by rate and other regulatory controls.

Present Period of Extension of Regulation

Before long a conviction developed that the serious problems of regulation were again changing character. New problems of interagency coordination and readjustment of railroad rates and services came to the fore. The financial difficulties recently experienced by the railroads and rail unemployment have constituted the immediate reasons for the almost continuing consideration given regulatory policy by Congress during the period 1933–40. The underlying factor has been the marked structural changes in transport deriving from technological developments.

The transportation situation occasioning readjustments in regulatory policy after 1933 was basically different from that of 1920. The encouragement to railroad investment given by the 1920 act and Government promotion of airways, highways, and waterways had resulted in such large investments in new facilities that a popular impression developed that supply had become excessive rather than insufficient.[21] Technological changes had extended the area of competition, providing attractive new alternatives to rail service and thereby lessening monopoly elements. Though shippers and user groups were generally well satisfied with these new conditions, the carriers, especially the railroads, were not. The conditions of competition were the chief source of carrier dissatisfaction.

The first Federal regulatory response to this new transportation situation was considerable *de facto* relaxation of railroad regulation by the Commission and minor legislative action in the same direction. The Commission soon realized that it was no longer possible for the railroads as a whole to earn the statutory fair return on a fair value of their properties; and it insisted that practical rate adjustments must give consideration to the effect of proposed rates upon traffic. In recognition of the need for allowing the railroads to meet the acute competition from other agencies, the Commission permitted thousands of reductions in specific rates upon short notice [22] and numerous exceptions to the long-and-short-haul prohibition.

Some relaxation by Congress of the 1920 standards was effected by the Emergency Railroad Transportation Act of 1933. Noteworthy modifications of this kind were the adoption of a new rule of rate making and the elimination of the recapture clause. The power of the new competitive forces as a regulator was legislatively recognized by abandonment of a statutory fair return and substitution of a standard which emphasized the effects of rates upon traffic. Except for serious consideration of a proposal to strip the long-and-short-haul prohibition of its teeth,[23] little further consideration was accorded this direction of policy. Yet there was evi-

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[21] According to the Federal Coordinator of Transportation "In the past 10 or 15 years of transportation development in this country, we have followed, unconsciously for the most part, a *policy of encouraging an oversupply of transportation service* * * * in the years 1920–32 approximately 25 billion dollars were put into new transportation facilities." [Italics supplied.] *Regulation of Transportation Agencies*, 73d Cong., 2d sess., S. Doc. 152, p. 22.

[22] *Ibid.*, pp. 59–63. The Commission's Annual Reports show that the total rail applications for authority to change rates on less-than-statutory notice for the actively competitive years 1932, 1933, and 1934 were approximately double those in 1925. The number of such applications granted showed a somewhat greater increase. The number of such applications filed rose from 5,560 in 1925 to a high of 12,569 in 1933 and the number granted from 4,387 in 1925 to 11,190 in 1933 (includes pipe-line rates). It is probable that a large percentage of the applications granted were to permit railroads to reduce their rates quickly to meet truck competition. The percentage of the applications granted to total applications filed rose from 78.9 in 1925 to from 86.3 to 89 in the period 1932–34.

[23] Thus the *Pettingell* bill to amend Section 4 was twice passed by the House (1935 and 1937), although rejected by the Senate. This proposal was strenuously opposed by coastal, intercoastal, and inland water carriers, who feared competitive annihilation, and commercial interests in western intermountain territory, who feared their rates would be increased absolutely or relatively. Protection of existing and promotion of additional locational advantages definitely influenced the votes on this proposal. Stuart Daggett, *Principles of Inland Transportation*, 3d ed., 1941, pp. 440–448.

dence of a considerable shipper receptiveness to further statutory relaxation in preference to the extension of regulation to other agencies.

In seeking desirable modification of regulatory policy, primary legislative consideration was given to the extension of regulation, roughly comparable to that applying to railroads, to other agencies. Without a widespread public demand and in face of vigorous opposition from many shippers and carriers, Congress acted to extend such regulation to common carriers by motor vehicle and water (not already regulated) in interstate commerce; regulation of a somewhat different character and of less intensity to contract carriers; and safety regulation to private carriers by highway.[24] Most State legislatures had taken similar action with respect to motor carriers previous to 1935 when the Motor Carrier Act was passed. The Interstate Commerce Commission was also made the regulatory body for all domestic carriers, other than the air lines, whose regulation also increased in this period.

This enlargement of the scope of regulation reveals an interesting reversal in source of support as compared with earlier enactments. Increased support came from carriers, but shippers as a rule were mostly content with existing controls or wanted even less regulation.[25] The explanation for the new attitude of shippers lies in their relatively stronger bargaining position today in dealing with carriers. The availability of a large variety of services and at most points alternative carriers, as well as a marked increase in the ability of both small and large shippers to provide their own transportation by operating private trucks, are factors.

The demand for economic regulation of motor carriers originated with the railroads[26] and the State commissions, which, as in 1887, found State control administratively difficult without Federal regulation of interstate commerce. Throughout the period 1925–35 these groups were the most ardent proponents of motor-carrier regulation, which also commanded the support of rail labor, investors in rail securities, and railroad supply industries. Some large motor common carriers joined hands in this movement, but many such carriers, contract carriers, and small operators generally opposed regulation. Significantly, a change of heart, at least so far as the large operators were concerned, occurred directly after the self-regulation and association effort made possible by the N. I. R. A. from 1933–35.

The real sources of rail complaint lay in the readjustments involved in coping with a growing competitive situation. These troubles led railroads to question public policy on the ground that it did not give them an equality of competitive opportunity.[27] They advocated comparable regulation for their major competitors as one way to restore such a condition,[28] but also to provide public relief from unsatisfactory results ascribed to widespread "destructive and wasteful" competition, such as financial demoralization of all agencies, excess capacity, disorderly market conditions, rate and service instability, increased business risks, uncoordinated transport, and poor and undependable service. Such consequences and a threatened breakdown of common-carrier service were also emphasized by the

[24] Numerous exceptions to certain classes of motor and water carriers, especially where non-competitive with common carriers, were granted by the Motor Carrier Act of 1935 and the Transportation Act of 1940.

[25] Shipper support was either conspicuously absent, fainthearted in character, or limited to certain shipping groups whose interests are peculiarly tied to the railroads. With respect to motor-carrier regulation, the facts show that the leading farm organizations, such as the National Grange and American Farm Bureau Federation, expressed their opposition. In his report to Congress on transport regulation in 1934, the Federal Coordinator of Transportation noted the opposition of the National Industrial Traffic League, a powerful organization of industrial shippers, to "any Federal regulation that goes beyond the keeping of records, the filing of reports, and joint arrangements for complete service between railroads and trucks." (*Regulation of Transportation Agencies, op. cit.*, p. 26.) This organization did, however, change its position to one in favor of "reasonable and logical regulation of highway transportation for hire, both as to rates and services" in November 1934, but by a close vote of 58 for and 55 against. (*A. T. A. News Bulletin*, Nov. 19, 1934, p. 4.) A qualifying statement was adopted to impress upon Congress that regulation should not extend to private carriers; that the natural advantages of highway transportation should not be destroyed; and that motor rates should not be adjusted to those of other agencies so as to require the public to support "* * * that part of the transportation investment which cannot be justified from a sound economic standpoint * * *" (Cf. statement of L. F. Orr, Chairman of the Highway Transportation Committee, before the Senate Committee on Interstate Commerce, 74th Cong., 1st sess., *Hearings on S. 1629 et al.*, part I, Feb. 25 to March 6, 1935, p. 285.) Certain established dealers in agricultural products, e. g., grain and fruits and vegetables, favored this regulation, because the merchant trucker and other truck operations were tending to develop new channels of distribution for these products. However, the continued apprehension of shipper groups in general is further shown by the action of the National Grange and other farm organizations and the National Industrial Traffic Legue in opposing extension of regulation to water carriers by the Transportation Act of 1940.

[26] Commissioner Eastman, Interstate Commerce Commission, recently remarked: "Take the Motor Carrier Act, 1935, as an illustration * * *. It was advocated by Federal and State authorities, of whom I was one, but the railroads were among its strongest backers and I doubt whether it would have been passed, if it had not in the end received large support from the motor carriers themselves." Regarding extension of Federal regulation to air and water carriers, he adds: "The Civil Aeronautics Act of 1938, which brought air carriers under Federal regulation, received its chief impelling support from the air carriers and their employees. The transportation legislation which is now pending in Congress, the most important feature of which is increased regulation of water carriers, resulted from a report made to the President by a committee made up of three railroad executives and three railroad labor executives, and it is favored by important groups of water carriers, although opposed by others." Address before Western Transportation Conference at the University of Southern California, April 11, 1940, pp. 5 and 6 (mimeograph copy). Cf. also, *Regulation of Transportation Agencies, op. cit.*, p. 33.

[27] For a discussion of the relation of promotional and public finance policies to inequality of competitive opportunity, cf. Part I Section VII, this report.

[28] For a good summary presentation of the railroad program, see the *Memorandum Containing Suggestions as to Needed Federal Legislation*, submitted to the Federal Coordinator of Transportation by the Association of Railway Executives, August 4, 1933.

Federal Coordinator of Transportation and the Interstate Commerce Commission in their support of a policy of unified and nearly uniform regulation.

These views reflected a changed conception of the primary regulatory task as compared with the 1887–1920 period. The emphasis was now placed upon the so-called objectionable features of "excessive" or "savage" competition. Shipper protection against monopolistic rate and service practices was no longer stressed as the important objective of public control. Rather, the contention was that the public interest required protection of stable and dependable common carriers against discrimination from other firms, especially contract carriers, and an excessive number of competitors. Shippers received rates so low as to be destructive to the carriers. Hence, floors to rates must be established and limitations must be placed upon the number of firms entering transport industries. Unified application of the minimum rate and control of entry powers would prevent "excessive" competition and modify its working so as to substitute a higher degree of economic coordination for the wastes of such competition.

The underlying general objective in 1920 of promoting an adequate transportation system by regulatory action to implement carrier profits was continued in the Motor Carrier Act of 1935 and the Transportation Act of 1940. But a change of emphasis occurred as to the chief tools for achieving this purpose. In 1920 it was assumed that the carriers could and would raise their rates sufficiently to earn a fair return on the system as a whole, if maximum rates were not prescribed at too low a level. Hence, a positive exercise of the maxmum rate power was considered the chief tool for attaining this objective, even though the minimum rate power was available for use in special cases where railroad control of competition broke down. On the other hand, after 1935 regulatory effort sought to prevent rates from falling to a point where sufficient earnings could not be realized. Therefore, emphasis shifted to the minimum-rate power and to limitation of entry, so as to curtail the revived competitive pricing in transport that had impaired the earlier method of control.

More specific objectives of recent regulatory legislation are revealed by the declaration of policy in the Transportation Act of 1940:

> It is hereby declared to be the national transportation policy of the Congress to provide for fair and impartial regulation of all modes of transportation subject to the provisions of this act, so administered as to recognize and preserve the inherent advantages of each; to promote safe, adequate, economical, and efficient service and foster sound economic conditions in transportation and among the several carriers; to encourage the establishment and maintenance of reasonable charges for transportation services, without unjust discriminations, undue preferences or advantages, or unfair or destructive competitive practices; to cooperate with the several States and the duly authorized officials thereof; and to encourage fair wages and equitable working conditions—all to the end of developing, coordinating, and preserving a national transportation system by water, highway, and rail, as well as other means, adequate to meet the needs of the commerce of the United States, of the Postal Service, and of the national defense. All of the provisions of this Act shall be administered and enforced with a view to carrying out the above declaration of policy.

Clearly, Congress has definitely subscribed to the popular theory that the transformation of competition in transport requires provision for "fair and impartial regulation of all modes of transportation." Reference to the substantive provisions of the new act indicates that "fair and impartial" regulation has been defined as requiring a system of public supervision of all agencies according to the railroad pattern. But neither the statement of policy just quoted nor most standards established to guide the Commission in regulating rates, entry, and other key controls provide a clear-cut and wholly consistent set of economic objectives for this regulation.[29] Left undefined, for example, are the phrases "unfair or destructive competitive practices," "sound economic conditions in transportation and among the several carriers," "developing, coordinating, and preserving a national system," or "fair wages and equitable working conditions," all general standards having primary reference to conditions within transportation as they affect investors, management, and labor in this industry. Nor are the requirements of an "adequate" service for commerce and other purposes specified.

Congress apparently recognized the possibility of too restrictive a use of the powerful controls extended over the transport market in order to protect either railroads or all regulated transport at the expense of other agencies or society as a whole. Thus such safeguards as the general admonitions "to recognize and preserve the inherent advantages of each" agency, "to promote * * * economical, and efficient service," and "to encourage the establishment and maintenance of reasonable charges for transportation services, without unjust discriminations, undue preferences or advantages," have been included in the general standards established. Moreover, certain safeguards appear in the rate and certificate provisions, but these need not be detailed here.[30] *Within the general framework of*

[29] For a discussion of the conflicts in recent regulatory policy with specific reference to the Motor Carrier Act of 1935, and conflicts between regulatory and promotional policy, cf. Charles L. Dearing's treatment in *Government and Economic Life*, *op. cit.*, pp. 831–857.

[30] For example, the proviso in the rules of rate-making limiting the Commission in its consideration of the effects of rates upon traffic may be cited. In giving weight to this factor, the Commission may consider only the effects of rates upon the traffic of the carriers for which rates are specifically prescribed. Thus, in considering motor-carrier rates,

a market protected by minimum rate and entry controls, Congress undoubtedly expects the Commission to allow transport agencies to develop on their relative merits and to afford the public the lowest cost transportation consistent with protection of the rights of both capital and labor in established concerns in all fields. This expectation will require the striking of a reasonable balance between public claims for rapid development of new agencies and techniques to lower costs and improve services and investor demands for stability and protection of capital invested in older agencies and established firms.

If the specific objectives of regulatory policy are indefinite, the principal powers granted to the Commission are not. To reiterate, its two most significant powers at present are those over minimum rates and entry. It is chiefly by the exercise of these powers that carrier protection can be accomplished in the competitive markets of today. Offhand, it would seem that their exercise must result in some, and possibly much, restriction of competition. Any of several theories of "constructive coordination" involving some restriction of competition can also be implemented by those powers.

To summarize, the effect upon the regulatory structure of the recent transformation of competition in transport has been a noteworthy increase in the scope and intensity of regulation rather than statutory or further administrative relaxation to allow recently released competitive forces greater freedom. This development seems paradoxical, in view of the fact that we continue in our regulatory policy to affirm our traditional public faith in competition. With this increase in the spread of regulation and in the positive powers of the Commission, the economic tasks to be undertaken have become more complex and difficult to perform. For unless the vital powers now in the hands of the Commission are only slightly used, this body must establish definite standards of profitability, risk, and social need to guide it in interfering with managerial judgment in quoting rates and expanding or contracting service and investor judgment in entering or withdrawing from the transport business. In controlling integration of the dynamic motor-carrier industry, it must also appraise the economies of scale, that is to say, find the point of bigness involved in the economist's term "optimum" size firm. These basically economic problems will demand an intelligent and forward-looking type of authoritative supervision.

In conclusion, this sketch demonstrates that ideas dominating national regulatory action tend to change with new technological, economic, and political conditions. If any generalization is tenable, it is that modification of public regulatory policy is a continuous process. Therefore, the question is pertinent: Are the recent far-reaching extensions of regulatory powers, made in a period of deep depression and rapid social change, of such worth as to justify making the new direction of policy a permanent one? Factors in reaching a dependable decision on this vital element of public policy to be discussed are: (1) the question of the effectiveness of competition in transport markets not subject to present standards of control; and (2) the types of economic effects resulting from the current system of "controlled competition."

for instance, the Commission is limited to considering the effects of rates upon the traffic of motor carriers. If motor rates are reasonable for motor carriers according to this test, they cannot be found unlawful because they might divert traffic from rail or water carriers.

The Problem of the Effectiveness of Competition

The leading supposition of our regulatory policy, common to periods of widely different conditions of competition and monopoly, has been that unregulated or non-uniformly regulated transport markets function unsatisfactorily in terms of economic results and equity. In a private-enterprise economy, regulation of the character and degree found in transport would not receive public support if the dominant view were otherwise. An attendant assumption is that public control will remedy undesirable market results.

The alleged and genuine failures of competition as a market regulator in transport form the principal bases of the present regulatory policy. Hence a re-examination of recent trends in policy poses the problem of surveying critically the features thought undesirable under the highly competitive conditions which inhere in the modern transport structure. This section will be devoted to such analysis.

It is the degree to which competition operates effectively in modern transport markets that is in issue. The workability of competition [31] is a matter for judgment, upon which opinions will naturally differ. But there should be general agreement on the proposition that perfect results cannot be expected reasonably either of competition or public control. It should also be agreed that factors of overpowering impact, such as the progress of invention, war, or depression, are not relevant to the issue. Because markets always function under dynamic economic, political, and social conditions, not all defects of market results are to be traced to absence of the conditions essential to effective competition.

[31] As Professor Clark points out in a recent article, it is important that the factors favorable to a working approximation of the ideal of "perfect" competition be discovered in order that we may have a standard more practicable than the unrealistic one of "perfect competition." J. M. Clark, "Toward a Concept of Workable Competition," *American Economic Review*, Vol XXX, No. 2, June 1940, pp 241–256.

It can be readily conceded that competition has its imperfections and that transport markets vary considerably in their mixture of competitive and monopolistic elements. But it is not easy to describe such markets in the usual terms of the theory of competition or monopolistic competition. A very large number of markets exist in which there is much variance in the number of firms competing for traffic, the degree of substitutability of their service and other factors of significance in defining the character of competition. Nevertheless, it is widely recognized that most transport markets in the intercity field are much more competitive, both actually and potentially, than heretofore;[32] and that this condition is likely to continue in the future, although with modifications introduced by the present regulatory process. To the railroads and water carriers serving particular areas and routes for many decades, numerous motor carriers of various size and service classifications have been added in recent years.[33] Moreover, pipe lines have become more numerous and air express service and additional water facilities, such as on the Columbia and Tennessee Rivers, have been developing. Hence, relative to past periods, many transport markets offer shippers more alternatives than in any time in history.

Even though the services of these leading agencies do not appear of identical value to shippers in terms of speed, convenience or responsibility, sufficient opportunities exist on a great many items of traffic for substitution of the service of one agency for that of another to make competition effective as to these commodities.[34] Alternatives from which shippers may choose are afforded whenever price differentials correspond tolerably well with quality differentials in service,[35] and this type of rate differentiation probably exists in competitive transport markets. On the other hand, on some important commodities, especially those which weigh heavily and move in bulk and for very long distances, the degree of substitutability of truck for rail service is unquestionably insufficient for effective motor-rail competition. For movements of such commodities water lines frequently compete with the rails, although this source of competition is not pervasive. Here, as in the past, the public must rely upon public regulation of the railroads as a check upon unreasonably high and discriminatory rates. However, if competition may be regarded as "effective or workable whenever it operates overtime to afford buyers substantial protection against exploitation at the hands of sellers and to afford sellers similar protection against exploitation by buyers,"[36] it would seem evident that inherent opportunities for effective interagency competition are so plentiful as to call into question a policy that gives them insufficient weight. Inclusion of competition among railroads and market competition in the calculations gives emphasis to this point.

Few have contended that competition in the markets for motor-carrier and inland water services is unworkable as a force to protect shippers from carrier exploitation. Shippers as a class have sponsored a public policy of heavy reliance upon competitive controls in these industries. The reasons are simple. Neither of these carrier types must sink large amounts of private capital in the highways and waterways upon which their vehicles and ships operate. Consequently, entry into these businesses, particularly into trucking, is not difficult where there are no official obstacles. The number of trucking firms, although insufficient for theoretically complete competition in many cases, tends to be relatively large, except where traffic density is very low. Typically the geographical extent of their services is limited as compared to that of the railroads. For these reasons it will be difficult for individual firms to discriminate seriously, although minor discriminatory practices are probable, such as quoting to one shipper a slightly lower rate than to others not closely in touch with the market.[37] Moreover, the high ratios of costs

[32] For example, Commissioner Eastman recently said: "Today, competition is the outstanding characteristic of the transportation situation. The railroads compete, not only with each other, but with trucks, busses, steamship and barge lines, pipe lines, and air carriers, and there is little, if any, of their traffic which is not subject, directly or indirectly, to competition." Address at Alleghany College, Meadville, Pa., May 2, 1940, pp 12–13 (mimeographed copy).

[33] In *Transport Co.—Control—Arrow Carrier Corp.*, 36 M. C. C. 61 (1940), the Interstate Commerce Commission cited facts not previously available as to the number of motor carriers of property operating between specific points. Of the 49 selected principal routes along the Atlantic Seaboard 42 had 5 or more class I common carriers; and of these, 9 routes had 5–9 carriers, 9 had 10–19 carriers, 14 had 20–29 carriers, 4 had 30–39 carriers, and 5 had 40–49 carriers, and 1 route had 62 carriers. For 10 of these routes only class I common carriers having general commodities among their rights were included. According to the Commission not all class I common carriers were taken, since only those mentioned in the record were tabulated. In addition, there were many class II and III carriers, carriers engaged only in intrastate commerce, and private carriers. For 7 of these routes, about which data were available, there was a range of from 6 to 48 class II and III carriers. That substantial motor-rail competition exists on these routes is indicated by the fact that 13 of them have direct rail service by 1 rail line, 15 by 2 lines, 3 by 3 lines, and 2 by 4 or more lines. Even the 16 routes without direct rail service have at least 1 indirect rail route involving only reasonable circuity and no more than 2 railroads. Number of rail lines computed from *The Official Guide of Railways and Steam Navigation Lines*, March 1941.

[34] According to Clair Wilcox, "Competition, to be effective, need not involve the standardization of commodities; it does, however, require the ready substitution of one product for another; it may manifest itself in differences in quality and service as well as in price." *Competition and Monopoly in American Industry*, T. N. E. C. Monograph No. 21, 76th Cong., 3d sess., p. 8.

[35] *Ibid.*, pp. 8, 9.

[36] *Ibid.*, p. 9.

[37] Though discrimination was mentioned, among other factors, as evidencing the need for motor-carrier regulation, it was not emphasized as in the case of earlier rail control. Where mentioned, the term often loosely referred to rate cutting by contract carriers below common carriers or rate cutting by small carriers under large operators. It sel-

that vary with traffic, even in short periods, discourage carriers from offering rates much below full costs, except in true joint-cost situations. If they do, it will generally be impossible to make up the deficiency in revenues by assessing rates above over-all average costs on other parts of their traffic, for noncompetitive sectors and traffic are scarce. The plain fact is that motor carriers as presently organized do not offer examples of inherently monopolistic utilities, even though frequently treated as such in law and administrative practice. To a lesser extent this seems true of water carriers.

The Alleged Destructiveness of Competition

The theory that unrestricted competition of motor and water carriers is an unhealthy condition nevertheless became widespread and received strong official support. The destructiveness of competition in free or nonuniformly regulated markets, both in interagency and intraagency spheres, was the general characteristic cited most frequently as evidencing the unworkability of competition as a market regulator. The term "destructive competition" has many meanings, but in discussions of recent regulatory policy it has often been defined as general below-cost rate cutting. Competition of this type is thought by some to operate normally and by others to crop up sporadically. Those who so characterize competition in transport believe that it oppresses efficient and inefficient carrier alike and deviates too far from the results of perfect competition to be acceptable as the sole or primary market regulator. They contend that competition can only be made effective by public regulation of the whole market.

Numerous symptoms of the destructiveness of competition in transport markets have been noted.[38] Chief among these is general unprofitability leading to financial demoralization of carriers, low wages for labor, and impaired standards of service. Others, some closely related to financial demoralization, include excess capacity, failure to obtain economies of scale, unrealized coordination, rate and service instability, impairment of essential common carrier service, and the failure of individual firms to consider social costs. Many of these symptoms, or objectionable features of competition, have been disclosed by carrier self-diagnosis, but they have also been widely regarded as indicative of the need for public control by those who think of the Commission in the role of a physician. A full kit of regulatory powers is regarded as prerequisite to the firm-eliminating operations and the minimum-rate prescriptions held necessary to the prevention of the disease of excessive competition.

These assumed objectionable characteristics of competition form the economic bases usually advanced for recent innovations in regulatory policy. However, in view of the unquestionably greater prevalence of the conditions necessary to effective competition in modern transport markets, these assumptions should be examined critically. If they do not stand up, the existence of a public need for regulation of present type to achieve better economic results will appear doubtful, even though such regulation may be justified on other grounds.

Financial Demoralization

One of the primary complaints against competition as a regulator has been that it brings about a continuing condition of financial demoralization in transport industries. According to the theory of public interest underlying the public controls recommended to remedy this condition, the low levels of profitability causing financial demoralization have harsh effects upon both carriers and the public. Carriers and their employees receive less than reasonable returns for their capital and labor contributions. The public, though gaining from low rates in the short term, suffers ultimately from insufficient or poor-quality service. Hence, with limitations placed upon expansion of firms and rate cutting to avoid excessive competition, the carriers and their employees gain protection by increasing carrier returns and the public obtains higher quality and more dependable service.

If transport industries are normally too unprofitable to draw sufficient capital, management, and labor to provide needed qualities and quantities of service, the only recourse open to Government is to adopt policies that create sufficient returns for private enterprise to do the job or to assume full public responsibility by Government operation. But have essential services actually been deficiently provided or are they likely to be deficient in the future? If not, should controls be maintained to afford carriers higher returns?

Prompted by carrier and investor complaints, legislators became actively aware of the unprofitableness of railroad operations during the depression of the 30's. The fact was demonstrated by low over-all returns and numerous bankruptcies and trusteeships, involving approximately one-third of total line mileage by 1938; also a large decrease in rail employment. The financial condition of the trucking business was more difficult to determine, because of lack of comprehensive financial

dom referred to a single motor carrier breaking down markets geographically for the purpose of varying rates according to the relative intensities of demand in each market. Few complaints involving discrimination cases, originated by shippers, have come before the Commission in 6 years of Federal control of motor carriers. This also contrasts with experience in the case of rail regulation.

[38] Cf. *Regulation of Transportation Agencies*, op. cit., pp. 5–35.

reports, the family nature of the industry, and the large number of independent firms. But there were frequent assertions of low returns both to owners and labor (frequently the same person) and of a high rate of bankruptcy. Many water lines were also found to be earning low profits or suffering deficits.

It does not follow from evidence of widespread lack of profitability during much of the period since 1929 that general unprofitability normally results from competition in the transport industry. The unprofitable condition in this depression may largely be traced to a temporary market oversupply occasioned by low levels of production and national income. The low financial state of the carriers in lean years, especially in such long depressions as that of the 30's, may justify certain specific protective restraints especially adapted thereto; but certainly does not constitute a guide to the long-run need of facilities or of Government action.

It may be desirable to employ minimum rate and other special controls in times of depression to try to put brakes on the downward spiral of prices and wages, as a part of a broad and integrated program of public action to prevent excessive deflation and its social hardships. But our regulatory statutes disclose no clear intention that the minimum rate and entry controls recently made effective were designed for application only in general deflationary periods. Actual use of the minimum-rate power has certainly not been thus confined. Despite substantial improvement in earnings since the recession of 1937–38, the Commission has continued to prescribe minimum rates, often higher than current levels, below which motor carriers may not lawfully go.[39]

Striking technological improvements in transport constitute another general factor accounting for many unprofitable railroad operations noted in the past decade. As a general proposition we may say that when more satisfactory ways of effecting transportation are displacing older techniques and facilities, it seems desirable to allow unprofitable and uneconomic transport sectors to be eliminated. Unless management can so improve services and reduce costs as to defray essential expenses and restore profits, the old means of transport should give way to the new as in other periods of our history. However, if the needs of some particular area require continuance of traditional plant and services beyond the level supportable by shipper revenues, the alternative of granting subsidies to the particular lines involved is available. Such differentiation in treatment would seem distinctly preferable to an effort to increase the profitability of the entire industry to the point where self-support could also be maintained in the particular sectors in which services may be threatened. Unnecessary additions to profits of carriers already having adequate earnings would thus be avoided and the public's total transportation bill minimized.

The popular concept of general financial demoralization is also defective as a basis for restrictive controls because the low rates of profit cited as occasioning this condition are usually computed on aggregate investments in transport industries. For example, low profits in the railroad industry usually refer to the rate of return on book or some adjusted investment for the system as a whole. The great differences between individual railroads, and between individual firms in other transport industries, are frequently overlooked. Yet, many railroads (including some of the more important) have been profitable enough all through the last decade to assure sufficient credit to keep their capital intact and to make important service and cost improvements. The public has not been, and is not likely to be, threatened with the loss of the services of these important carriers.

A more disturbing threat to adequate standards of service might be expected where carriers are forced to enter trusteeship or bankruptcy. But most railroads in this condition have continued to serve their patrons and often have shown improvement in their facilities

[39] *Trunk Line Territory Motor Carrier Rates,* 24 M. C. C. 501 (1940), and *Midwestern Motor Carrier Rates,* 27 M. C. C. 297 (1941). In a partially dissenting opinion in the former case, pp. 625–631, Chairman Eastman clearly expressed concern over invoking the minimum rate power even though profitability had improved substantially as compared with 1938. Comparing conditions in earlier territorial cases decided in 1938 and those in this one, he said (pp. 626–627): "We there found that the power to fix minimum rates which is given us by the Motor Carrier Act is to be interpreted and administered with a view to accomplishing the declared purposes of the act, among these being the duty which it imposes upon us, in the regulation of transportation by motor carriers, to 'foster sound economic conditions in such transportation and among such carriers,' and to 'promote adequate, economical, and efficient service by motor carriers, and reasonable charges therefor' without 'unfair and destructive competitive practices.' *We also found, in each one of those cases, that we were confronted with what appeared to be an emergency.* Financial disaster had fallen upon many of the carriers, and many others were threatened with like disaster. Net earnings, where they existed at all, were at a perilously low level, and in the panic superinduced by such conditions an epidemic of rate cutting in the hope of getting more traffic had set in or was imminent. Drastic action, such as we took, seemed to us to be the only means of meeting this emergency, and we acted accordingly although we realized that we were stretching to the very limit our minimum-rate authority.

"Does a similar emergency exist here? The financial results of operations which were submitted of record and which are recorded in the report do point to such a conclusion." But citing additional financial reports of the carriers, allowed by stipulation, he continued: "In 1938, the operating revenues of the 138 carriers totaled $55,905,837.18 and their operating expenses $54,926,187.19, resulting in a net operating revenue of $979,649.99. In 1939 their operating revenues totaled $68,070,107.78 and their operating expenses $65,484,444.51, resulting in a net operating revenue of $2,585,663.27.

"It will thus be seen that while the financial results from operations are still none too favorabe, they have improved very materially since the periods whose results were submitted of record. If an emergency then existed, it has certainly abated since that time, and without the purported benefit of any order such as is now proposed, except in one portion of the territory." [Italics supplied.]

and services. Service is lost where rail lines are abandoned, but in many cases for-hire or private trucks provide a fairly adequate substitute. When a particular truck line enters bankruptcy, its service may be lost owing to the small-scale character of the business. But others continue and new ones enter the field, when permitted, assuring adequate service. The complaint has been that too many carriers entered the field at the very time business was most depressed.

Unless measures of profit are subjected to much refinement, minimum rate and entry controls may give protection to capital irrespective of the wisdom of the investment. Not all railroad or other transport capital should be maintained physically or continued in profitable operation. Poorly located facilities should be eliminated, in recognition of the mistakes made when investment occurred. Moreover, inefficiently operated firms should either adopt more efficient managements or be eliminated entirely. In any case the perplexing questions of the basis for valuation arises. It is doubtful that Congress in providing our current regulatory policy sufficiently scrutinized the earnings experience of the rails and other agencies.

Public policy should increase the profits of transport firms already in the business by restricting price competition only if such action is necessary to promote adequate quantities and standards of service. But sufficient quantities of service have been provided. The service break-downs and inadequacies in the World War period and after, which created a public attitude favorable to rate standards fostering greater rail investment, have not been duplicated for nearly two decades. The peak demands of the present emergency may prove an exception, but any failures of supply occasioned by the war could hardly be attributed to unregulated motor and water competition.

Whether a sufficiently high type of service can be rendered if competition is unrestricted is a debatable question. In general shippers appear to feel that the emergence of competition from the motortruck has stimulated many desirable improvements in the quality of service that otherwise might not have come. It is true that some complaints of irresponsible truck operations were offered in the early days of truck transport, but it is probable that the numerous alternatives available gave most shippers adequate protection from this danger. If not, surety bonds and similar minimum standards would have merit superior to general restriction of competition. A protected market may enable authorized concerns to raise service standards in terms of reliability and convenience, but probably at the expense of higher rates and a smaller variety of services from which to select the particular combinations of quality and price for a shipper's special needs. The widespread opposition of shippers to extended minimum-rate and entry regulation suggests that the service standards under competitive controls were generally satisfactory.

Finally, the promotion of increased carrier profits by regulatory means in order that higher incomes can be realized by owners and labor has been a factor in the concern expressed over financial demoralization. To some degree such an objective must have been sought by Congress in passing the Motor Carrier Act of 1935 and the Transportation Act of 1940. The problems of adjustment created by displaced labor and unprofitable investments in established transport agencies and firms should receive public consideration as in other sectors of the economy. However, unless needed to safeguard service standards, it should be recognized that financial protection goes beyond the usual concept of public interest based upon transportation needs of shippers and constitutional safeguards to private property devoted to public use.

When consideration is given the temporary impact of depression, the special force of revolutionary technological change, the great differences in the situation of individual firms, and the continuance of sufficient quantities of service despite low returns, financial demoralization offers a questionable economic basis for a policy of restricting competition by minimum rate and entry controls extended over the entire transport market. However, if it is desirable for public policy to seek expressly to improve profits in transport for the special protection of capital and labor, the costs and reliability of such regulatory means of achieving producer protection should be compared with more direct methods of amelioration.

Excess Capacity

Oversupply of transport facilities is related, as we have seen, to financial weakness; but it is attacked also on its own account, as inherently wasteful. While excess capacity is ascribed in part to Government promotional policy, the competitive organization of the industry is also blamed. Restriction of entry is the direct regulative solution.

Excess capacity must be admitted, but the need of the remedy, as an antidote for waste, does not follow. Much of the apparent excess comes from irregularities in traffic flow, daily, seasonal, and cyclical, and the importance of having facilities to meet peak requirements. Some is attributable to features of industrial location which cause unbalanced hauls. A great deal grows out of the emphasis on quality service—fast, frequent, specialized—adapted to industrial and marketing practices. Much apparent excess capacity really consists of facilities being made obsolete by the use of rival

and, in some ways, improved methods of transportation, a normal accompaniment of a competitive regime. Historical perspective is helpful. For example, though many canals were displaced by the expanding rail net in the middle decades of the 19th century, this displacement now seems quite logical and economical. The same is true of bicycles and wagons that have been displaced by automobiles and trucks in more recent times. Of course all under-utilization is not explainable along these lines. Part of it reflects a faulty adjustment of transport development to demand. But this situation is not peculiar to transportation; and the waste here does not appear to be so serious as to call for exceptional treatment.

The case of unused capacity in depressions deserves special mention, for then the low use of existing facilities naturally puts the free development of new agencies in a bad light. Despite low ratios of utilization of the railroads in the depression of the 1930's, allegations of disturbing excess capacity are now infrequent. Indeed it now appears obvious that the railroads and other agencies require additional capacity to satisfy the demand for carriage. Though the present volume of traffic may be exceptional in view of the national defense boom, it is clear that the large excess capacity of a few years ago was a temporary condition.[40] The Nation is fortunate to have at its disposal in the present emergency the great increase of facilities of all kinds which seemed so disturbing in 1932.[41]

Failure to achieve a reasonably close adjustment between the supply of motor-carrier facilities and demand for the service of this type of carrier is sometimes attributed to the imperfections of competition. These are presumed to lead to an excessive number of firms and result in an uneconomic spreading of traffic over such a large number of firms as to result in permanent under-utilization and higher rates to cover higher unit costs.[42] Whatever may be the general tendency in theory, the high turnover commonly noted in the trucking field obviously attests to the effectiveness of competition, even with its imperfections, in eliminating inefficient firms. When efficient as a regulator, competition necessarily involves the loss of capital funds by particular investors. Some real resources may be wasted, but this is inherent in any risk-taking, even by the State. In trucking, elimination of particular firms involves no waste in specialized highway facilities. Vehicles, the largest item of investment, are readily transferable to other uses. Unless regulation can make all firms profitable under widely varying conditions of demand and entrepreneurial ability, the burdens to investors and others from such adjustments seem unavoidable.

The case of unused capacity in railroading is different. Excess capacity, except for prosperity and emergency peaks, seems to have persisted in this industry, and, in a physical sense, it has been increased by development of new agencies. In some cases, i. e., certain lines of Western railroads, this excess capacity is a product of the overbuilding of rail plant in the days of unrestrained financial buccaneering and land grants by the Federal Government. In any case, prominent duplication of railroad terminals and facilities was a transport problem[43] many years before the road-rail problem became a public issue. Because of the specialized and durable nature of much rail capital, there is some ground for believing that entry and investment in this field should have been controlled from the first.

The water field is an intermediate case. Entry and withdrawal are more easy than in railroading, but less so than in trucking. Peak facilities developed during war shipping emergencies, much of which are thrown upon the market afterwards, complicate the picture. Even so, it is economical to use existing ships, even though a market oversupply may thereby be created. Unused capacity from this source in this or other fields cannot be ascribed to ineffectiveness of competition.

Economies of Scale

The economic case for a policy of restricting competition logically rests to a very considerable extent upon the assumption that free entry into the motor-carrier field discourages the development of economical large-scale operations.[44] In theory, imperfections of

[40] The effects of the 1929–33 depression upon railroad traffic, revenues, and earnings were pointed out in numerous studies and comments on the railroad problem during the gestation period prior to extension of regulation to motor carriers. Cf. Moulton, H. G., and Associates, *The American Transportation Problem*, Brookings Institution, Washington, 1933, chapters III and IV. Moreover, the higher utilization and greatly improved earning power of railroad plant by 1940 must have been apparent to Congress when it enacted the Wheeler-Lea bill.

[41] If profitability were increased by minimum rate regulation at such times, excess capacity might be increased. Controls now in force give power to restrict the number of firms, but little authority to restrict investment in trucks and other facilities by existing concerns upon authorized routes. Hence, authorized firms might increase their facilities in response to such increased profitability.

[42] For penetrating discussions of the problem of interpretation and management of excess capacity associated with market imperfection, cf. Nicholas Kaldor, "Market Imperfection and Excess Capacity," *Economica*, New Series, Vol. II, No. 5, Feb. 1935, pp. 33–50, and J. M. Cassels, "Excess Capacity and Monopolistic Competition," *The Quarterly Journal of Economics*, Vol. LI, No. 3, May 1937, pp. 426–443.

[43] Recognized as such by the Transportation Act of 1920, which gave the Commission control of extensions and encouraged railroad consolidation.

[44] "There are those who maintain, however, that a system of free and open competition is well adapted to the operation of water lines or trucks and will produce good results with those forms of transportation, chiefly because of the ease of entrance into the business and the practicability of small-scale operations without large investments of capital. Even if these agencies could properly be considered alone, * * * there would be no sound basis for this conclusion * * * *And while it would be unwise in any way to close the door to small-scale operations, a system which discourages the development of large-*

competition obstruct desirable growth in the size of trucking firms. An excessive number of firms, induced by ease of entry and simple managerial problems, compete for available traffic. Since service is differentiated, uncontrolled competition will not adequately perform its function of forcing the elimination of high-cost firms, either absolutely or through absorption by the stronger firms. By limitations placed upon entry, however, the number of firms can be restricted and the average volume of business per carrier can be increased. Such public control is therefore advocated as essential to attainment of the most economical scale of operation.[45]

The possibility of securing lower costs and/or better service in the motor carrier industry by encouraging the growth of large firms may appear attractive in view of the pronounced development of large-scale enterprise in other fields of transport and industry. However, there are two questions that should be considered: Has free entry obstructed the economical growth of large firms? Have large firms been proved more efficient?

It is certain that free entry has kept down the average size of firms. It seems equally clear that public authority can be employed to offset this condition. But it is also true that firms that are large according to trucking-industry standards have developed in considerable numbers in all important traffic areas. In the late 20's and even in the early depression years after 1929 many men started with a truck or two and in a fairly short time had businesses with annual revenues of $100,000 to a million or more.[46] Though many firms of large size today may have registered more rapid growth since Federal regulation began, the fostering influences of restricted entry and prescribed minimum rates obviously were not essential to the growth of large-size firms before 1935. Earlier State regulation could not have been an appreciable factor, for it was incapable of restricting entry into the interstate field. Here, as in other competitive fields of production, fairly large firms seem quite capable of developing without governmental assistance. Of course, many truckers failed and were replaced either by existing or new firms. This is further evidence that competition was working so as to eliminate excess and high-cost firms that could not compete successfully with the more efficient ones.[47]

Information is lacking for a satisfactory answer to the question whether size of firm is a vital factor in efficiency in the trucking industry. There is some evidence that small concerns operate as effectively as large. Economists have often been skeptical of great economies of large-scale operations in this industry. Locklin concludes that what little evidence is available, though inconclusive, does not indicate any more profitable operation for large firms.[48] And Cadbury's study points to lower costs for small truck operations in Great Britain.[49] The Interstate Commerce Commission in the leading unification case from the standpoint of size decided so far held that the alleged economies to be derived from a proposed firm capitalized at approximately $25,000,000 were not convincing.[50] The possible advantages of large size of firm is limited in

scale operations is certainly not to be desired." [Italics supplied.] *Report of the Federal Coordinator of Transportation, 1934*, 74th Cong., 1st sess., H. Doc. No. 89, pp. 11–12.

[45] It appears that both improvements in service qualities and lower unit costs and rates are anticipated. In simple terms, one operator running 100 trucks will produce more service in a given period than 100 entrepreneurs each with one truck.

[46] The trucking industry has not been financed by public subscription of stocks and bonds, as were the railroads. Cf. Part II, Section III, 2, this report.

[47] The frequent assertion by truckers that the shippers press down their rates by threatening to transfer their traffic to other carriers is itself evidence that services of different truckers may be readily substitutable. The absence of advertising and other types of emotional appeals as an important factor in selecting truck service also supports this conclusion. Hence the imperfections of competition may have been overstressed as a factor in explaining the small-scale characteristic of the trucking industry.

[48] *Economics of Transportation*, revised edition, 1938, p. 764. According to Locklin, "If economies of large-scale enterprise were evident in the motor-carrier industry, a tendency toward the formation of a few large firms would appear. Although some large units have developed, a large number of small operators persists. What little evidence is available does not indicate any more profitable operation, at least, among the large concerns. In fact the evidence points to the opposite conclusion."

[49] Cadbury, L. J., "Large and Small Firms: A Note on Costs in the Road Transport Industry," *Economic Journal*, vol. XLV, No. 180, Dec. 1935, pp. 789–793. Cadbury concludes on p. 790: "With these qualifications, the schedule produced below is of considerable interest, showing as it does that in certain specific cases about which it has been possible to obtain accurate and definite figures, the larger concerns have no special advantage, and indeed that for limited mileages the small man seems to be able to operate more cheaply than his rivals."

[50] In the *Transport Co.—Control—Arrow Carrier Corp.* case, the Commission denied an application to combine 27 class I motor carriers and certain subsidiaries in the Atlantic Seaboard territory, including some of the largest and most profitable firms in the territory, in part on the ground that the expected economies were improbable. The Commission said: "In the absence of evidence that similar consolidations or expansions of operations on such a large scale have produced results anticipated by applicant, the testimony with respect to proposed economies and improvements in service is not convincing." 36 M. C. C. 61, 78 (1940). As would be natural on such a vital question, differences of opinion appear to exist within the Commission itself. For example, in a partially concurring separate opinion (p. 95) in this case, Commissioner Eastman indicated willingness to experiment on the ground that this same evidence clearly indicated "* * * that the opportunities for greater economy and efficiency of operation which would be opened up by the creation of a unit of the size contemplated are extensive and important * * * I should like to see the experiment tried." The Commission's approval of the integration of 8 of these companies in *Associated Transport, Inc.—Control and Consolidation—Arrow Carrier Corporation, et al.*, decided March 16, 1942, permits this experiment to be tested, but on a smaller scale (1939 revenues totaled $17,000,000 as compared with 1939 revenues of $32,000,000 for the entire 27 carriers). Though the Commission found substantial operating economies in this case, Commissioner Splawn dissented: "The alleged opportunities for economy are vague and speculative, and the same general statement could probably be made with respect to any proposed consolidation."

motor transport by the fact that the chief facility, the highway, is publicly provided, and its use is rigidly limited by State size and weight limitations. Sacrifices in the prime advantages of trucking, its flexibility and personalized service, would also be likely under firms of large size.

Accordingly, the possibility of achieving economies from larger trucking operations appears to be limited on the basis of available information.[51] But whatever the degree of advantage through growth of firms, its realization does not seem to depend on governmental action, nor to constitute a substantial reason for restriction of entry. The most that can be said for such a policy on existing information is that greater experimentation, approved by Commissioner Eastman, would be possible under a protected market. Experimentation under such conditions might prove to be an expensive policy, for once the structure of the industry has been changed fundamentally it would be difficult, indeed, to restore the former conditions should the experiment fail. The pressure that would be exerted by the large and well-organized firms for aid from the regulatory body in controlling the market would be hard to resist in view of the fact that regulatory policy itself had encouraged the growth in size.

Failure to Achieve Constructive Coordination.[52]

In unregulated or nonuniformly regulated markets, the tendency for much traffic to be distributed to transport agencies not best fitted to haul it, in terms of cost and service measures of efficiency, is popularly deplored as one of the principal failures of competition. Recent regulatory acts extending minimum rate and entry controls to motor and water carriers have been based in large part upon the theory that only with such regulation can a truly economic allocation of traffic between competing agencies be achieved. This presumption will be examined only briefly, for the entire subject of coordination is treated elsewhere.[53]

The objective of seeking to reduce wastes in the utilization of transport resources by assuring that each agency will carry that traffic for which it is the most efficient has been viewed generally with favor. But here general agreement ends. There is disagreement over both the tests for determining the most efficient interagency traffic distribution and the methods to be used in accomplishing the general goal. Even to the extent that economic coordination has been made an objective of present regulatory policy, it is very difficult to determine the precise tests of coordinated transport that the Congress intended should be applied. Some general standards, such as "to recognize and preserve the inherent advantages of each" agency, have been supplied. Nevertheless the Commission has been given a rather general directive to use its minimum rate, entry, and other powers "to the end of developing, coordinating, and preserving a national transportation system." What regulated coordination means in practice must be determined by analysis of cases and by observation of transport developments.

One meaning sometimes given to coordination is that interagency traffic flows are truly economic only when free market allocations are restricted sufficiently to protect the rail-rate structure from too drastic and rapid readjustment.[54] This concept is partly based upon a belief that railroads can be operated economically and profitably only on a rate structure giving much weight to the value-of-service principle. But it is also based upon a concept of economy which includes stabilizing industrial and agricultural location relationships, which in part have developed on the basis of the distribution of the rate burden effected by a rail-rate structure constructed under a high degree of monopolistic pricing. Admittedly, competition has forced this rate structure with its relatively high rates on short hauls and high-value-of-service commodities to give ground to competitively determined rates, more closely, but not precisely, adjusted to unit costs.

If restricting competition to keep in force the traditional form of the rail-rate structure is a desirable public policy, then application of minimum rate and entry controls to all agencies, including private car-

[51] Considerable factual information, not hitherto available, relating to performance and cost measures of efficiency as affected by size of motor-carrier firms is presented in the staff report in the Commission's investigation of the need for Federal regulation of sizes and weights. *Federal Regulation of the Sizes and Weight of Motor Vehicles*, H. Doc. No. 354, 77th Cong., 1st sess., Aug. 14, 1941, Appendix D, pp. 612–614. Table D–9 presents selected operating statistics of for-hire motor carriers of general commodities for October 1940, by region and revenue class of carriers.

[52] The Federal Coordinator of Transportation has held up "constructive coordination" as preferable to "destructive competition." The general meaning given these terms is indicated in his phrasing of the issue posed: "Stated more concretely, the question is whether it is sound public policy to encourage duplication of facilities and warfare all along the line, or to find the work which each form of transportation can do best and endeavor accordingly to build up a national transportation system in which the various agencies will function with more regard to correlation and less to competition and with a minimum of waste." *Regulation of Transportation Agencies, op. cit.*, p. 4. The Federal Coordinator expressed the view that only by regulation of minimum rates and entry could such coordination as is "the foundation for financial stability and lower transportation costs and rates" be secured.

[53] Cf. Part I, Section IV, 1, this report.

[54] The Federal Coordinator revealed this goal as one element of the problem of constructive coordination. "This likely tendency to a radical change in the rate structure might be tempered and controlled under public regulation to an extent impossible under free competition. However, the private truck sets definite limits to any policy of modification. * * * The prospects are that there will be disruption of the rate structure in any event, but there is more chance of keeping this tendency within reasonable limits with comprehensive regulation than without." *Regulation of Transportation Agencies, op. cit.*, p. 34.

riers, whose competition is a disruptive factor of consequence to the railroads would be essential. However, such a policy would be likely to retard technological change and benefit vested groups having direct or indirect interests in the railroads. It is to be doubted that Congress sought to lessen the rate of technological change in order to promote stability in the existing locational pattern for agriculture and industry,[55] though it may have intended to give some protection to the railroads in this manner. Promotion of stability of existing locational advantage would be a rather vague goal for regulatory policy in a single industry such as transport. But granting that policy should seek to maintain or to retard changes in industrial and population patterns, it is doubtful that restricting competition in transport markets to the extent necessary would be the most economical method of accomplishing this goal. Before technological improvements of tested value are sacrificed for this type of coordinated transport, more specific statement of the gains to be derived thereby should be available for public consideration.

The primary concern of the coordination school has been to find the work which each form of transportation could do best on the basis of relative costs and service efficiency and to create the conditions essential to traffic flows in accordance with this principle. Competitive controls have been held to be incompatible with achieving this objective.[56] On the other hand, regulation of entry and minimum rates has been regarded popularly as a superior method.

Subsidies to some competing agencies have been cited as one obstacle to the competitive method of achieving coordination, since prices of subsidized services are not based upon carrier costs plus costs defrayed by Government in providing public facilities. Such prices do not reflect true relative economy in the use of resources, and the consumers' judgment in the market is not a reliable guide to traffic distribution. Granting this truth in certain cases, the same defect will usually be found in regulated minimum rates. In testing minimum rates the addition of governmental costs for providing right-of-way or other public facilities to costs actually incurred by carriers would be required to remedy the cost distortion. However, regulatory bodies would confront great practical difficulties, possibly some constitutional ones, in attempting to make such cost adujstments. Nor would such cost inflation be sensible, for it would amount to utilizing the rate regulatory agency to defeat another purpose of Congress—to promote the subsidized agencies. Then, too, rates high enough to cover governmental costs as well as carrier costs would tend in some cases to make possible profits higher than necessary to call forth adequate service and in other cases would lead to under-utilization of public facilities.

In any event restriction of competition and use of available public facilities does not seem a direct or very secure way of solving the difficulty. The more direct and certain remedy is to correct this diseconomy at its source, by changing the public-promotion policies that are responsible for the subsidy. Tampering with carrier competition and price relationships between alternative agencies not only is indirect but also lessens the opportunity of some carriers and agencies to compete on an equal basis. If the newer agencies are being restricted, their full competitive force is lessened. Thus one objective of fair and impartial regulation is defeated at the start. Moreover, on no issue in transportation has there been more controversy than over the meaning and extent of subsidies.[57] Then, too, once capital is sunk by Government in waterways and highways, it should be utilized, as in the case of railways, so long as returns to the State cover maintenance costs.

Such evidence as exists of the economic characteristics of transport agencies fails to support convincingly the assumption that competitive pricing will not tend to allocate traffic to the most effective agencies. Competition, despite certain imperfections, will probably distribute traffic according to the economy test at least as well as authoritative supervision. Before complete regulation, subsidy notwithstanding, a great deal of traffic was already being allocated as between agencies in apparent accord with relative cost and service efficiency. It is also important to note that competition seems to have sufficient staying power to be a reliable regulator. Competition of the self-eliminating type developed only in the railroad industry, where joint and common costs were significant and individual firms had financial power to sustain general below-

[55] Individual members of Congress were undoubtedly influenced by locational bias in their voting on the Motor Carrier Act of 1935 and the Transportation Act of 1940. Yet so far as any expressed concept of coordination appears in present statutes, it consists of setting up broad standards defining the requirements of transportation efficiency *per se*. The activity of pressure groups most interested in extending regulation suggests that the policy reflects a desire to protect carriers and labor rather than specific locational ends. The interpretation is possible, however, that the types of regulatory power extended reveal an intent to prevent the locational *status quo* from being changed too rapidly by technology.

[56] The Coordinator expressed his opinion as follows: "There are some who think that the thing to do is to let down the bars and allow the competitors to fight it out to the finish. * * * The eventual result might be a kind of coordinated system of transportation, achieved through survival of the fittest, but the greater competitive strength of the railroads would be likely to distort the results. The fact is that this plan of free-for-all competition has never worked successfully, either here or elsewhere. It has been tried and found wanting." *Ibid.*, p. 23. It is noteworthy, however, that railroads did not succeed, if they tried, to drive out truckers in significant numbers.

[57] Cf. Charles L. Dearing, *American Highway Policy*, Brookings Institution, Washington, 1941, CH. VII, for a concise statement of the subsidy issue and its bearing upon the general transportation problem.

cost rate cutting for relatively long periods. Even so, experience before 1935 does not demonstrate that the railroads, with admitted potentialities for destroying individual motor competitors, exerted such price-cutting pressure as to force them to the wall, to enter into rate and traffic agreements, or to sell out. Possibly one reason for this restraint was the knowledge that the policy would not pay, for after reducing their competition by such means the railroads would only invite another crop of motor carriers when they raised rates to take advantage of greater monopoly power.

Hence, the destructiveness of competition which constructive coordination might lessen is apparently not the self-eliminating type. The term referred rather to excessive competition tending to impair earnings. But this tendency has already been found wanting as a basis for uniform regulation. On the other hand, when workable, whether or not controlled, competition is destructive in the sense that it eliminates overly high-cost firms. If it regulates the market efficiently from society's standpoint, it must be destructive to individual enterprises and wage earners of low efficiency. Permanent policy should not employ regulation to prevent this effect of competition. But whatever the policy, it should be recognized that subjecting price and investment decisions to Government control will not eliminate the wastes of human error, though it may reduce or increase them in individual cases.

A fatal defect of coordination by authoritative supervision is that it necessarily gives too little stress to the dynamics of transportation. In this respect the traffic allocation of a freely functioning market mechanism seems generally preferable to a regulated distribution of traffic. For as new methods and the presence of joint and common costs justify lowering rates, the entrepreneur is free to try to attract more traffic by lowering his rates without having to face the organized opposition of the majority, many of whom are likely to be high-cost carriers indifferent to shipper needs and new possibilities for economizing operations. Nor do the delays of rate bureau procedure and regulatory supervision hold up price reductions made possible by greater efficiency attained by individual firms. The tendency for regulatory bodies to use historical average costs for a group of carriers as a test of reasonable minimum rates also slows up technological progress, for often the costs selected will be too high to give full effect to cost-reducing techniques. The average cost test for particular rates prevents effective utilization of empty or partially loaded equipment on back hauls. Competition, on the contrary, not only subjects the enterprise to severe tests to survive, but seems the most certain method of obtaining technological improvements without undue lags.

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It does not appear necessary to restrict entry and prescribe minimum rates of all agencies to obtain economic coordination of a dynamic type, although these controls make possible achieving allocations of traffic that diverge from competitive allocations. Coordination is an ambiguous term. The subjects covered by it should be examined separately and controls with respect thereto decided upon their own special merits rather than upon a general assumption that competition on balance is defective as the primary market regulator.

Rate and Service Instability

The need for a high degree of public control is also presumed to follow from excessive rate [58] and service instability under such competitive conditions as existed previous to extension of regulation to motor and water carriers. Stable rates are considered essential to reduction of the risks of rate changes that disturb competitive relationships among shippers. Thus it is often suggested that shippers are more interested in rate relationships than in the level of the rates. Recurring entrance and withdrawal of firms under uncontrolled competition are believed to threaten stable and responsible service.[59] A disorderly and chaotic market works against financial stability and the ability of carriers to maintain their equipment and facilities.

Undoubtedly adjustments in rates and services would continually take place under uncontrolled competition. Moreover, unless regulation is to have a completely stagnating effect, many, although fewer, changes of this kind would also occur under regulated markets. In either case shippers and carriers alike would have to note the competitive effect of changing rates and services and adjust their operations accordingly. Competition cannot operate well without frequent rate and service adjustments and any system of controls designed to make competition work more effectively must provide

[58] The Federal Coordinator stressed the harm from rate instability as follows: "The public has also a decided interest in an orderly functioning of the entire transportation mechanism. While some shippers gain temporary advantage from unstable and unpublished rates, the greater present good and the long-run good of all require that the transportation factor in the cost of doing business be known and predictable. The truck has changed a situation in which substantially all these requirements were met to one of widespread uncertainty, instability, distrust among shippers, and undue discrimination and prejudice, particularly in favor of the large shipper. Trucks have done much to break down a system of rate control which was subject to deliberate adjustment to changed conditions, but a system whose very deliberateness and openness were in fact substantial virtues." *Regulation of Transportation Agencies, op. cit.*, p. 22.

[59] According to the Federal Coordinator, "A broader aspect of responsibility also deserves mention. This relates to the maintenance of truck or bus service on which the shipper or traveler has come, perhaps entirely, to depend. Certainly no responsibility is felt by the motor-transport industry today to maintain unprofitable or relatively unprofitable service, such as the railroads have maintained, frequently voluntarily, although sometimes by order of public authorities. The highway operator assumes a lesser degree of responsibility for a complete coverage of the transportation needs of the area he sets out to serve." *Ibid.*, p. 23.

for a high degree of flexibility in these respects. It should also be noted that much of the rate and service instability given attention during the formation of present policy was due to the tremendous technological innovations in the transport structure and to general deflation in the great depression. These forces are not normal and their effects probably cannot be wholly or largely avoided.

Rate stability has various meanings. If it means merely that the surprise element in rate changes should be eliminated and that an orderly procedure is essential, then these requirements could be met by requiring all agencies to publish and adhere to filed rates, with changes only upon reasonable public notice. This standard would not prevent that individual action which is essential to active price competition, but it would give shippers foreknowledge of rate changes and help to eliminate personal discrimination.

Rate stability, however, often seems to imply more than establishment of an orderly procedure for carriers to make rate changes. It may also imply that few or no changes in rates for long periods and uniform rates for all carriers irrespective of service differences. Such standards could only be achieved by placing restrictions upon price competition. Their dependable realization would obviously require use of the minimum rate power, implemented by control of entry, or industry control of rates, or both. Placing the burden of proof regarding the lawfulness of a reduced rate upon the carrier seeking the change, as provided by the Transportation Act of 1940, is another related device.

Not all shippers concur in the need for employing minimum rate and entry regulation to achieve such rate stability as is desirable.[60] In the days when railroads constituted almost the entire transport industry and the power of monopolistic discrimination could be widely exercised by individual firms, shippers were understandably willing to make some sacrifices in higher and more inflexible rates, if necessary, in return for more stability in rates and greater equality as between persons and areas. But today for many items of traffic on which motor-carrier alternatives to rail service are at hand, the danger of discrimination is not great enough to make shippers as a class willing to sacrifice the advantages of price competition for more stable rates. Since many shipper groups, including long-haul agricultural shippers, have widely advocated lower rail rates in recent times and have encouraged motor carriers to find their own competitive rate level, they apparently believe that essential rate relationships can be maintained under active price competition.

There is general shipper skepticism also of the alleged disadvantage of unstable service, in the sense of firms entering and withdrawing constantly from the market. Where alternatives are few, as in the days when only one or two railroads served a community, a threat of withdrawal or impairment of service is obviously of serious concern. But with many firms offering competitive truck services on all significant routes and economical private trucking easy to establish, the entrance or withdrawal of any one or the poor service rendered by a given carrier is of little general significance. It is also relatively unimportant that individual motor carriers do not ordinarily serve as large a geographical area or undertake to haul as many commodities as individual railroads, since supply is flexible when routes are not restricted artificially. New or additional arrangements may have to be made by certain shippers where a motor carrier folds up or is found not willing to serve all points and traffic. Usually, however, except on purely rural routes, other concerns will be available and willing to bid for the traffic.

If financial stability essential to a continued ability to serve had been impaired by free entry prior to 1935, the impairment was not serious enough to discourage rapid growth in motor carrier service in this period of general depression. Any irresponsibility as to claims could be removed by minimum insurance standards or by the shipper carrying his own cargo coverage.

Such stability as shippers desire may be achieved by regulation other than control of entry and minimum rates. Rate and service stability to afford higher returns to carriers is another matter. The subject of financial demoralization from "excessive" competition has been treated.

Impairment of Essential Common Carrier Service

Perhaps the most important service disadvantage of active competition, according to the advocates of uniform regulation, is its alleged tendency to impair common carrier service, which is assumed to have its traditional special significance to the public at large. Uncontrolled competition between common, contract, and private carriers in the motor and water industries was emphasized by the Federal Coordinator of Trans-

[60] The shipper groups cited by the Federal Coordinator of Transportation as complaining most critically of "the uncertainties and vagaries of the present situation" were certain dealers in fruits and vegetables, coal, cotton, grain, and lumber. *Ibid.*, p. 22. The complaint of these groups can be traced mainly to the fact that the merchant trucker and other marketing agencies using truck transport are displacing the old line service wholesaler, who would like to continue as a receiver of carload lots by railroads. Although the new and often more direct marketing methods are claimed to glut the market, break down grades and standards, and reduce producer prices, studies in the Department of Agriculture have shown skepticism of such arguments. Cf. George R. Taylor, Edgar L. Burtis, and Frederick V. Waugh, *Barriers to Internal Trade in Farm Products*, March 1939, pp. 58–67.

portation as a factor in damaging essential common carrier service.[61] In such competition the common carrier was thought to be handicapped by the obligations of his common-law and statutory status. The small shipper was believed to bear the ultimate burden resulting from the tendency of contract carriers to take truckload traffic at rates below those that common carriers could afford to offer and of private carriers to participate in for-hire traffic on back hauls. Forced by the scale of his operations to rely upon common carriers at higher rates, the small shipper would be at a disadvantage in competition with larger shippers who could operate their own trucks or employ contract carriers. The remedies suggested were control of minimum rates of contract carriers and restriction of the right of private carriers to haul traffic for compensation.

The tradition that common-carrier service is of special public significance is long and honorable. The same is true of the need for protecting small shippers from discrimination in rates and service. Yet modern transport conditions have lessened both the dependence of shippers upon common carriers and the danger of discrimination against small shippers. Small shippers are not so helpless in comparison with the large shippers as they once were. The small shipper, too, may frequently avail himself of the direct alternative of supplying his own motor-freight service by buying a truck or trucks, without bearing operating costs higher than the large private carrier. This alternative may be especially attractive when his shipments are distributed in a local area or in one prevailing direction. Private operation of trucks by industrial and commercial concerns does not encourage industrial monopoly as in the case of private operation of ocean shipping lines and rail facilities. Of perhaps more importance, the small shipper now has the advantage of many competing motor common carriers, in addition to normal rail and water alternatives, to which he may turn. These alternatives of small shippers are frequently more attractive than their former one of bearing the costs of appealing to a regulatory body, before which large shippers and carriers were likely to be better represented, for relief from the discriminatory rate and service practices of the highly monopolistic rail carriers.

Common carrier service did not disappear in the competitive period prior to Federal regulation. Common carriers apparently competed quite successfully with contract carriers on truckload shipments by giving quantity reductions, often graduated according to various weight classifications. Where common carriers grant such quantity discounts to shippers having shipments of sufficient size to avail themselves of the lower rates, discrimination is not ordinarily alleged by shippers whose shipments are below the applicable minimum weights. Lower rates for carload shipments have long been a standard rate practice in railroading. The truck has brought lower minimum weights and more variation in rates according to size of shipment,[62] and thus has tended to reduce the rate disparities between large and small shippers. Moreover, if contract carriers can render service at lower cost or a service better adapted to a shipper's needs, it would seem economical to permit their development. The same is true of private truck operations, especially since so many shippers can economically operate trucks in their own service.

If developments in transport have largely destroyed the monopoly position of common carriers and have often made private transport more economical, the thesis of the special importance of common carrier service must be somewhat out of date. Giving special protection to common carriers under these conditions from the competition of contract and private carriers, on the theory that otherwise the cost of their service will rise and rates will be too high, is surprising in a private-enterprise economy, whose basic characteristic is freedom of choice by the individual. Such protection seems likely to be in the interest of the protected class of carriers rather than of shippers.

Inevitability of Regulation

The admittedly vigorous competition in motor and water transport is sometimes said to be reliable as a regulator for shipper protection only for short periods. Competition would, according to one point of view, eventually be replaced by concerted action to control rates and distribution of traffic between carriers. Such industry control would proceed by restricting service and raising rates, to the disadvantage of shippers and the public; public control is therefore necessary. Obviously, a carry-over from experience with the railroads and local utilities, this basis for establishing public control has been a minor one, except for retaining safeguards to prevent destructive competition by the railroads against motor and water carriers. Yet it should receive some examination lest the analogy lead to error.

It is a well-known fact that before the NRA and the Motor Carrier Act motor carriers did not develop effective organization of such types as to be able to make many and effective agreements on rates and traffic. Even in intrastate commerce, where regulation was found, truck associations did not exist in all States. Most of those that were established were ineffective

[61] Cf. *Regulation of Transportation Agencies, op. cit.*, pp. 7, 12, 34.

[62] Cf. *Federal Regulation of the Sizes and Weight of Motor Vehicles, op. cit.*, Appendix D, pp. 643–653.

in controlling the market, since small carriers and contract carriers were generally not willing to come into the fold. The fact that the large common carriers comprising the membership of those organizations were the sources of most of the pressure upon the State legislatures for laws to limit entry and support rates suggests that the industry had not obtained control of the market. Moreover, it may be well to reiterate that the agitation for State and Federal motor-carrier regulation did not come from shippers protesting high rates and discriminatory practices made possible by effective group action by carriers. It came rather from carriers complaining of too much competition and too many independently minded carriers. It is also well known that though shipping conferences have been established in many water trades, especially in oceanic shipping, they have frequently not been effective. Recent water-carrier regulation was not based upon the monopoly power of shipping conferences. Had the situation been otherwise, the demand would have been for more effective application of the anti-trust laws or for control of discrimination and maximum rates.

Nor is it probable on theoretical grounds that cartelization would have become widespread and troublesome in the trucking industry. The limited economies of scale and ease of entrance would likely have prevented the number of firms becoming so small as to make concerted action common or sufficiently effective to injure the public. Government implementation has been an essential requirement for effective agreements in the motor-carrier industry. The facts of the past 6 or more years adequately demonstrate that competition in the motor-carrier industry can only be effectively controlled when the endeavors of industry groups to make agreements on rates and traffic are supported by Government action.

In conclusion, this discussion of the effectiveness of competition as a regulator of modern transport markets has proceeded by reexamining the claim that it operates with so many objectionable features that the safeguards of minimum rate and entry controls must be applied to all agencies. Though not presented as a complete examination of how well transport competition does work in accordance with practical tests of effectiveness in either totally unregulated or only partially regulated markets, the analysis nevertheless casts serious doubts that the economic case thus made for uniform application of these key controls is well founded. If shipper protection against exploitation by carriers, in the long run as well as in shorter periods, is the important test of effectiveness, competition with all its imperfections has proved tolerably workable as a regulator. The absence of shipper agitation for, and any pronounced shipper motivation in, recent regulatory legislation demonstrates this truth. By greatly weakening private monopoly power, the more active and widespread competitive elements inherent in the transport structure of today have been limiting the area where discriminatory practices and unreasonably high charges can be practiced by the carriers. They have also stimulated enormously the impersonal pressures exerted in the market toward efficiency as measured both by service improvements and cost reductions. It must be recognized that many of the features that have been deplored have their sources in events which the suggested restriction of competition cannot prevent. Others are the normal accomplishment of effective forms of competition.

The advantages of modifying our present regulatory policy to restore greater freedom and scope to the vigorous competitive forces inherent in the present transportation system naturally suggest themselves. Yet the Nation has recently been committed to public supervision of transport rates and services in the highest degree ever practiced in this country. It therefore should be illuminating to review some of the principal economic results and effects now working themselves out in the regulated markets that have been fashioned under present policy.

Economic Tendencies Under Present Regulation

Our experience with 6 years of Federal motor carrier regulation should provide a practical check upon the wisdom of present regulatory policy. Study of the practical implications of the more controversial features, i. e., minimum rate and entry controls, is indispensable to a decision as to the desirability of continuing this experiment.[63] Accordingly, the actual effects of regulation upon the transport structure and, more importantly, upon costs, rates, service standards, choice in selection of service, and opportunity for enterprise should be carefully noted. The economic results obtained under such a regulated market can then be compared with those promised as well as those obtainable under competitive controls.

A realistic search for the implications of key controls requires a probe into the economic situations out

[63] The laboratory stage of regulation under current standards was pointed out by Commissioner Eastman in his Oct. 22, 1940, address before the Associated Traffic Clubs of America, Philadelphia, Pa., as follows: "The task of regulating competition effectively and wisely is, in my judgment, much more difficult and dangerous than the task of regulating monopoly. Justice between competing carriers as well as justice between carriers and shippers is essential, and great care must also be taken not to deprive the country of the real benefits of the enterprise and initiative which competition most certainly stimulates. There are some thoughtful men who think that no regulation of competition, except for the protection of the public safety, can be successfully administered. I do not share that opinion, but I do think that we are still in what may be termed the laboratory stage of such regulation and that considerable experience will be necessary to determine what policies are wisest." (Mimeograph copy, pp. 8, 9.)

of which specific regulatory issues arose. For example, it is sometimes stated that if a regulatory body does not deny applications for operating authority where public convenience and necessity is proved, no restriction of competition results from denials where this test is not met. This view, however, overlooks the possibility that criteria applied in determining whether the public convenience and necessity require a new service might not be in accordance with economic principles. Observation of the changes taking place in the structure and functioning of transport markets as a result of such control affords a more secure basis for judgment. Unfortunately, few studies representing this approach are available, and examination of the facts of record in certificate and rate cases would require more time than has been allotted for this study. Hence, any precise measurement of the economic effects of present policies is out of the question. This comment is limited to a suggestive exploration of the direction of structural developments and economic effects most likely to take place.

Fewer Trucking Firms

The tendency toward fewer firms in the motor-carrier industry is a structural effect in accordance with the apparent design[64] of present regulatory policy and predictions often made before the advent of Federal control. Under the Motor Carrier Act the number of firms can be limited directly by denial of authority to begin or extend operations and indirectly by making entry more difficult and expensive and by limiting the freedom of individual firms to attract traffic by offering rate reductions. Prerequisite to lawful operation are certificates of convenience and necessity for common carriers and permits for contract carriers, with adherence to tariff, insurance, safety, and report requirements. Since all carriers with bona fide operations when the act became effective were blanketed in, direct restriction of the number of firms is largely effected by discouraging new operations.[65] But once entry is authorized, carriers are completely free to add to or subtract from their existing equipment. They must observe, however, all restrictions placed in their certificates and permits as to routes and points served, commodities handled, and types of service offered.

The obvious result of denial of applications to start new trucking businesses must be to limit the number of firms in transport markets. Though data are fragmentary, some evidence exists that many applications for authority to operate common-carrier service by motor vehicle in the interstate field have been denied by the Commission. A recent study by Daggett shows that between June 1936 and February 1939, 333 such applications for certificates of convenience and necessity were denied by the Commission while 718 were granted and 261 were partially granted or denied.[66] The complete denials constitute 25.4 percent of the total and together with the partial denials comprise 45.3 percent. As the cases selected include both applications for new and for continuance of old operations, they constitute a less accurate measure than applications for new services taken alone.[67] A sample discloses that preponderantly it is the small would-be operators who are excluded from the trucking business in this manner.[68] Moreover, of the 104,685 applications for certificates, permits, licenses, and certificates of registration filed with the Commission by October 31, 1940, 26,891, or 25.7 percent, had been approved and 66,931, or 63.9 percent, had been denied, dismissed, or withdrawn. The remaining 10,863 applications, of which 6,274 were "grandfather" cases where operations were permissible until final action, were pending.[69] When necessary adjustments are made, the Commission's figures for denials cannot be taken as conclusive that a heavy hand is being placed upon enterprise in the motor-carrier field.[70] The data from both sources, however, do indicate a restrictive tendency.

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[64] Cf. *Competition and Monopoly in American Industry*, *op. cit.*, p. 268.

[65] We have no occasion in this study to explore in detail the practical tests applied by the Commission in the many different situations that have arisen. At this point it will suffice to show that the effect is to limit the number of firms. It is the advisability of entry control that is in issue, not the faithfulness of the Commission in interpreting statutory standards.

[66] Daggett's table summarizing this inquiry includes both bus and truck cases, but only those in which the Commission rendered a printed report. He observes that the number handled without a printed report is usually greater and states that a test made of this type of case during January and February 1939, disclosed that 25 applications were denied and 55 approved on recommendation of joint boards or examiners. Cf. Stuart Daggett, *Principles of Inland Transportation*, 3d edition, 1941, pp. 637–8. An unpublished survey by William E. Carpenter, Division of Marketing and Transportation Research, Bureau of Agricultural Economics, of 832 applications of agricultural carriers for interstate operating authority formally acted upon in 1939 by the Commission showed that 62 percent were approved, 30 percent were denied, and 8 percent were pending as of September 1940. Thirty-five-percent of the denials were for want of public convenience and necessity or consistency with the public interest. The remainder were denied for want of prosecution, lack of jurisdiction, or at applicant's request. The sample taken included both new and "grandfather" applications by common and contract property carriers.

[67] In a sample of the first three volumes of Motor Carrier Cases, Daggett found that of the 130 applications for certificates denied, 111, or 85 percent, involved new services and of the 181 such applications granted, 92, or 51 percent, involved new services. *Letter*, May 8, 1941.

[68] Of 91 applications for truck certificates denied between June 1936 and December 1937, 41 involved operators owning 1 vehicle each, 5 having no equipment, and 32 owning from 2 to 5 vehicles. However, Dagett observes that the Commission authorizes more small operations than it rejects. Daggett, *op. cit.*, p. 638.

[69] *54th Annual Report*, November 1, 1940, p. 108. No further breakdown of applications denied or granted is given.

[70] Only 13,141, or 12.6 percent, of the total involved new operations. Hence, most of the 66,931 applications denied, dismissed or withdrawn must refer to "grandfather" cases. This large number reflects many applicants who filed when in doubt as to whether their operations were covered by the act. Later many such cases were found to be in exempt classifications or in purely intrastate commerce. Some may have sought

Entry into the trucking industry is also frequently discouraged by the burdens of conforming to regulatory requirements. Operations on a small scale can be established with only a modest amount of capital and technical knowledge. Hence, the extra costs of meeting minimum insurance and safety standards,[71] preparing suitable tariffs, participating in rate bureaus, and appearing in hearings when issues are contested must constitute a hindrance to such small operations, even though the Commission's field force has given much aid of an educational nature to would-be operators. Entry might be discouraged further by the requirement that the newly established operator must charge no lower than prescribed minima. His opportunity to use rate reductions as a device to attract business would thereby be restricted, except at the risk of high fines for tariff violations. Having to compete on a quality of service basis at uniform established rates often would be difficult for the new concern.[72]

Larger Trucking Firms

Another structural effect of regulation consists of a probable tendency for the size of the individual trucking firm to increase on the average. This follows directly from the restrictions placed upon the number of entries into the motor-carrier field. With fewer firms in operation than under free entry the volume of traffic per firm is greater. The continued expansion of the industry since 1935 in response to higher levels of business activity has meant a greater volume of traffic to be divided among a smaller number of firms than would have been in operation in the absence of regulation. However, data to measure the exact increase in the size of firms are unavailable.

Evidence exists that regulation may also be promoting a more rapid growth of larger firms than of the smaller types.[73] The accelerated momentum of the integration movement after the passage of the Motor Carrier Act has been officially noted.[74] An analysis by Meck and Bogue of 147 motor carrier unification cases decided by the Commission in 1940 shows that predominantly the very small enterprises are being absorbed by firms already of medium size or large.[75] The largest merger yet proposed, that to organize the $25,000,000 Transport Co., by integrating 27 leading class I Atlantic Seaboard common carriers, their subsidiaries, and certain truck-rental companies, was denied by the Commission,[76] but already a proposal by Associated Transport, Inc., involving a smaller number of the same group of large carriers and a financial plan purporting to remove features criticized by the Commission has been approved by this regulatory body.[77] No doubt other such integrations of already large trucking companies may be anticipated. More unpredictable is the question whether integrations will be of the rail-truck type to a larger extent than in the past. These are among the most fundamental structural problems in transport, of which public policy must not only take serious note but for which it must find an effective answer. Continued integration of small trucking firms by larger ones is likely.

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rights to peddle later at a profit. Others withdrew their applications for a variety of reasons, including better opportunities elsewhere, delays in securing action, and realization of the difficulties of conducting a regulated business.

[71] This does not imply that higher costs to provide the public assurance of reasonable financial protection for injuries or damage due to accidents or to promote safety are not justified. These advantages can be secured, however, without restricted entry and established minimum rates.

[72] The evidence given does not prove that a smaller absolute number of firms operate in the motor-carrier business today than in 1935. What it does suggest is that fewer sellers probably compete in the markets for motor freight service than would have been the case had free entry persisted in the interstate field after 1935. Comparative data are unavailable. Nevertheless, it is plausible to believe the number has decreased, because some withdrawals have undoubtedly continued, integration has been encouraged by regulation, and replacement of withdrawing firms must have been restricted in view of the facts cited above.

[73] A leading west coast operator, Leland James, president of Consolidated Freightways, Inc., reflected this view in a recent address on "Current Problems of Truck Transportation" before the second annual Western Transportation Conference at the University of Southern California. He said: "In my opinion, Federal regulation is not an unqualified blessing; in fact, it may prove to be a handicap. When regulation supplants the law of survival, the vigor of the regulated industry is apt to decline. This is especially true when regulation takes from some and protects others. *Already we know that regulation is promoting the growth of larger, slower moving, more conservative organizations at the expense of the smaller independent, more vigorous, more individual, and more resourceful operators.* In spite of all the admonitions that the trucking industry wrote into its regulatory law against destroying the character of the industry, the administration of the regulatory law is surely changing its character. True, there are arguments that this is for the best, but do those arguments take into account the fact that regulation was applied to the industry while it was still very young * * *?" *Motor Transportation*, vol. XVI, No. 4, April 1941, pp. 12, 43. [Italics supplied.] The number of class 1 carriers (with annual gross revenues over $100,000) is on the increase. In its *54th Annual Report*, Nov. 1, 1940, p. 107, the Commission stated: "Our records indicate that during the calendar year 1939 there were 1,324 class 1 motor carriers. During the calendar year 1940, this number increased to 1,405, of which 203 were motor carriers of passengers and 1,202 were motor carriers of property." To acquire this status a carrier must show revenues of $100,000 a year on the average for a period of 3 years. While some of the increase may be due to oversight or failure to report, it is likely that most of the increasing number is due to growth.

[74] Cf. *51st Annual Report*, Nov. 1, 1937, pp. 77, and *54th Annual Report*, Nov. 1, 1940, pp. 32,111. The number of applications for authority to unify under sec. 213 by year were 122 in 1936, 286 in 1937, 214 in 1938, 305 in 1939, and 314 in 1940, or a grand total of 1241 by Nov. 1, 1940.

[75] "Truck unifications classified in this survey number 147, of which 111 acquisitions were made by carriers with assets of more than $50,000 and less than $500,000. Twelve carriers with assets of more than $500,000 and less than $1,000,000, and 4 carriers with more than $1,000,000 in assets acquired new properties, while, at the other extreme, only 2 carriers with assets of less than $25,000 made acquisitions. Of the total 147 transactions, 96 involved consideration of an expenditure of less than $10,000, 34 involved between $10,000 and $25,000, and only 17 more than $25,000." John F. Meck, Jr., and Robert W. Bogue, "Federal Regulation of Motor Carrier Unification," *The Yale Law Journal*, Vol. 50, No. 8, June 1941, pp. 1421–1422.

[76] 33 M. C. C. 61 (1940).

[77] Cf. *Associated Transport, Inc.—Control and Consolidation—Arrow Carrier Corporation, et al.*, decided March 16, 1942.

The great danger of a policy of sponsoring fewer and larger firms is that the development may contribute eventually to a tight control of the market by the larger and better organized firms.[78] If this happens, there would be no assurance that any economies achieved by large-scale operations would be passed on to users through lower rates.[79] Monopolistic profits might be earned, or the additional revenue might be spent on service competition, raising costs but not giving commensurate benefits to users. On the other hand if large-scale operations prove less economical, either the larger firms would be eliminated or, more probably under a protected market, the rates for all carriers might be raised by minimum rate orders in response to higher costs and low profits of the large firms. If competitive forces become weaker under a situation with fewer and more dominant firms, greater reliance would have to be placed on Government regulation to restrict profits and to promote internal efficiency. The strong pressures exerted by carriers upon the Commission and the predominant carrier-motivation of present policy should be considered in any realistic expectation of the effectiveness of regulation. Consideration should also be given to the fact that public-utility regulation in general has been more successful in restricting monopoly profits than in promoting efficiency of operation.

Growth of Organization Designed for Concerted Action

The tremendous growth in rate association activity in the trucking industry since Federal regulation became effective is a structural factor of far more immediate significance than the development of fewer and larger firms. Whereas it may be true that the number of firms, except on rural routes,[80] has not decreased enough from restrictions placed upon entry to alter competition significantly, there can be no question that organization developments, stimulated in large degree by the regulatory process, have already changed the character of competition in this industry.

The story of the effects of regulation upon competition and rates can be told largely by relating the activities and proposals of the groups of carriers cooperating in trucking associations, conferences, and rate bureaus. The stimulus of regulation to growth of such activity is easily traced, although a thorough historical study of the trade association movement in this industry is not available. The importance of regulation as a factor in the growth of organization for industry leadership has been acknowledged by the American Trucking Associations, Inc.[81] The close relationship between rate bureau activities and regulation is shown by the Commission's practice of adopting with minor modifications, the rates proposed by leading bureaus as reasonable minima for all common carriers in important traffic territories.[82]

The first stage in the recent acceleration of association activity in the trucking industry on a regional and national scale occurred during the NRA period. State associations of large common carriers existed in many States by 1933, but their activities were confined to State regulation and other problems. The first truly national body, the American Trucking Associations, Inc., was formed in 1933 to satisfy the NRA code re-

[78] The Commission feared some impairment of competition on routes on which traffic moves between the southern region and points north of Baltimore, if the Transport Company unification were to take place. 36 M. C. C. 61, 86 (1940). Moreover, the Antitrust Division of the Department of Justice entered an appearance before the Commission and opposed, together with the Department of Agriculture and certain shipping organizations, the application of the above-mentioned Associated Transport, Inc., for authority to unify eight large motor carriers along the Atlantic Seaboard. In his letter to Chairman Eastman requesting the opportunity to be heard, Assistant Attorney General Thurman Arnold stated: "The reason for my request is that judisdiction to determine whether unification of carriers unduly restrains competition has been given to the Interstate Commerce Commission. The Antitrust Division is the only Government agency in a position to present evidence on the monopoly question from a point of view of the public interest. Evidence presented by private parties necessarily must be colored by their own property interests in the controversy." *Brief of the Antitrust Division, Department of Justice*, Oct. 8, 1941, p. 40.

[79] It should be reiterated that the economic case for regulation designed to restrict the number and to increase the size of firms depends in large measure upon *actual* realization by large firms of lower costs, better service, or both, and the passing on of such economies to the public. However, the prospects of greater economy in trucking from larger operations than would develop normally do not appear bright. Even if they did, some groups would doubtless oppose encouraging the growth of large firms for the sake of efficiency on the ground that opportunities for the small business man should be safeguarded to preserve the values of an individualistic society.

[80] The case of strictly rural trucking routes supporting only one or two motor carriers seems comparable to that of rural towns with only one or a few retail stores. Though small volumes in these cases may leave unit costs high, public opinion is often a sufficient regulative force. In any case, such places exerted little, if any, pressure for regulation of motor carriers. Of course, many small towns located on main highways between larger places are served by a number of motor carriers of property, whose primary business is to serve the large centers of population.

[81] In its mimeographed memorandum on *Motor Bureau Rate Procedure*, dated Oct. 5, 1937, p. 1, the statement is made that: "Any person observing the motor-carrier industry at the time of the passage of the Motor Carrier Act would have found no excess of tariff organization on the general industry landscape. While there were numerous organizations and bureaus of more or less limited nature, there was almost no development so far as regional or area tariff bureaus were concerned. This was largely due to the fact that the industry was new, and to a large measure, unregulated, especially in respect to rate matters. Most new industries are lacking in organization and this industry which offered unlimited opportunities for the operator was not an exception; and on the part of many, organization was not desired. As tariff bureau organization calls for discussion, conference, agreement, and equality, this result was inevitable. Neither carriers nor shippers have ever been known to display very great enthusiasm for the perplexing problems of cost analyses and rate formulae, especially if they were for the purpose of making concrete progress."

However, with the passage of the Motor Carrier Act, these characteristics were largely forgotten, *especially on the part of the more influential and farsighted operators*. Exceptions, and glaring ones, prevailed. Yet it was soon obvious that the Motor Carrier Act would result in profound changes for *conversation, conference, and correspondence, together with vital leadership in a few places*, led the carriers to see the desirability and necessity of rate bureaus. [Italics supplied.]

[82] See Part I, Section III, 1, this report.

quirement of national representation.[83] State code authorities and some new State trucking associations were organized as administrative adjuncts of the Code of Fair Competition for the Trucking Industry. The A. T. A. has since become the unquestioned leader of association activity in the industry, and rate conferences established by some State code authorities frequently served as the nuclei for formal rate bureaus established after the Motor Carrier Act was passed. The many discussions of rate problems and cost formulae under the NRA paved the way for rapid development of effective concerted action on rates under this act.[84]

After the demise of the NRA but before the Motor Carrier Act became law on August 9, 1935, the organized trucking industry again bestirred itself in the direction of establishing more comprehensive and effective machinery for common action on the vital subject of rates under the anticipated commission regulation.[85] Regional rate committees were formed and met frequently to discuss freight classification principles and rules, principles for truck rates, and the desirability of filing uniform rates on the initial filing date under the Act.[86] Truck-rate bureaus sprang up in this formative period, many organized specifically to provide a method of solving the rate and tariff problems discussed in these State, regional, and national conferences.[87]

By December 1935 about 25 motor tariff bureaus were said to be in existence.[88] Soon interest quickened in strengthening and consolidating bureaus because of the large number of tariffs filed, rate disparities, tariff duplications and a reported downward spiral of rates attributed to efforts of individual operators to safeguard their competitive position.[89] As of recent date there were 211 agents having effective tariffs on file with the Interstate Commerce Commission, of which 160 represented tariff bureaus or trucking associations.[90] Undoubtedly many of these bureaus owe either their existence or the extent of their present operations to Federal regulation of motor carriers.

The Commission early gave its general approval, with some reservations of course, to the efforts of the trucking industry to organize itself for concerted action on rates.[91] The first director of the newly organized Bureau of Motor Carriers, appears to have given con-

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[83] Cf. *The National Recovery Administration*, Brookings Institution, 1935, ch. V. In a footnote, p. 107, illustrating the action of deputy administrators in influencing trade association development, the following references to the situation in the trucking industry appear: "In the case of the trucking industry, two competing national associations and scores of regional groups filed codes. At the end of the first series of conferences between the deputy administrator and the associations, the Administration refused to negotiate further on the basis of separate codes and instructed the associations to pool their efforts and present a single code. When this was accomplished, negotiations were reopened."

[84] In his address before the second annual convention of the American Trucking Associations, Inc., Chicago, week of Oct. 14, 1936, Maurice Tucker, chairman, National Rates and Tariffs Committee of A. T. A. recapitulated the rate activities under the trucking code as follows: "We all know that in the industry's rapid growth, its tariffs have not followed any specific pattern * * * Without becoming too historical, I want to call your attention to the rate activities carried on by the industry under its code. While the code did not permit of rate agreements and its provisions did not bring the anticipated relief and benefit in rates, *nevertheless operators were brought together and discussed their rate problems. A better understanding was developed among the members of the industry, and did much to pave the way for the intensive activity that has been under way in the last few months.*" [Italics supplied.] *Transport Topics*, Oct. 21, 1935, p. 4.

[85] For example, the A. T. A. organized an Interstate Carriers' Conference Committee which met in Washington on July 1 and 2, 1935, and a Steering Committee of 25 operators from the whole country met on July 15 to discuss, among other things, "methods of setting up trucking rate classifications, and the selection of regional committees." *A. T. A. News Bulletin*, July 15, 1935, p. 1. The July 22 issue, p. 1, reports the appointment by A. T. A. of a National Rate Committee with the duty of considering "the problems of rates and tariffs, classifications, and general rules necessary to the stabilization of rates"; and that the Steering Committee had "pledged its wholehearted support to the undertaking and volunteered to cooperate in the setting up of rate committees within the 12 industry regions. The Steering Committeemen will contact the various State associations of truck operators and urge the selection of three representatives from each State to be appointed by A. T. A., to meet with a like number of representatives from every other State in the Union, which groups will constitute the regional rate committees. The members of the Steering Committee will work with the regional committees and the entire activity will be coordinated by the national rate committee." This rate organization plan materialized rapidly, for the July 29 issue (p. 3) reported the formation of rate and tariff committees in 13 States and the District of Columbia and the September 2 issue (now called *Transport Topics*, p. 1), in 46 States.

[86] Cf. *Transport Topics*, Nov. 11, 1935, pp. 1, 4, and June 1, 1936, p. 1. Shippers participated in some of these conferences, generally urging that truckmen adhere to a rate structure based upon their own costs in preference to the principles of the rail rate structure.

[87] For example, rate committees in nine southern States formed the Southern Motor Carriers' Rate Conference Committee in October 1935. *Ibid.*, Oct. 28, 1935, p. 3. This was characterized as "one of the first tariff agencies expressly organized by and for truck operators to file and issue rates under the Motor Carrier Act * * *" *Ibid.*, Nov. 4, 1935, p. 1. The Nov. 11, 1935, issue (p. 3) reports a proposal by representatives of the Middle Atlantic States Motor Truck Conference, Inc., to establish a tariff bureau for New York, New Jersey, Pennsylvania, Delaware, and Maryland; the Middle Atlantic States Motor Carriers' Conference, one of the most active groups in securing stabilization and uniformity of rates under minimum rate orders, resulted. *Ibid.* Dec. 2, 1935, p. 2.

[88] *Ibid.*, Dec. 30, 1935, p. 2, wherein their "mushroom-like development" is mentioned.

[89] A resolution to establish 5 regional bureaus to absorb the activities of 30 or more active ones was agreed upon by bureau representatives and members of the National Classification and Rates Committee, A. T. A., at a Chicago meeting in May 1936. The resolution sought among other objects "to eliminate and prevent the publication of duplicate rates and provisions * * *; to stabilize the general rate structure for motor carriers and particularly to establish a central office through which all motor carriers within the area may intelligently cooperate in arriving at a just and fair rate structure, * * * and to facilitate inter-territorial rate adjustments, and *discourage sporadic and individual publications by single motor carriers or groups;*" [Italics supplied.] *Ibid.*, June 1, 1936, p. 4.

[90] *Agency List No. 1*, which contains a list of agents filing motor freight tariffs with the Bureau of Motor Carriers as of March 4, 1941. A large number of rate bureaus are shown to have filed at one time, many of which are now inactive in the interstate field.

[91] In its *50th Annual Report*, Nov. 1, 1936, p. 74, the statement appears: "We believe that the motor carriers of property should be encouraged in their efforts to bring a greater degree of order and stability into the rate structure through conferences and group consideration of common problems, and expect many good results from such endeavors. It may be anticipated, however, that eventually we shall be called upon in formal proceedings to give consideration to many of the rates, for the protection both of the carriers and of the public."

siderable encouragement to the movement by truck operators to "put their own house in order."[92] From these rate conferences the Commission seems to have expected aid in keeping price cutting within "reasonable limits" and in securing a greater degree of uniformity in motor rates.[93] Such aid has often been given willingly by organized groups by protesting changes in particular rates proposed by individual firms and by presenting proposals for minimum rates for large territories in the so-called emergency situations after 1938.

There is little reason to believe that this widespread growth of association activity on rate matters could have developed to its present extent and degree of effectiveness had the Motor Carrier Act not been passed. The organizations set up under the NRA no doubt would have attempted to continue to function in rate matters, but, in view of the extensive use of the minimum rate power in recent years, they could hardly have been effective in making their rate agreements stick for any considerable period of time without such government implementation.

The fact that organization for group consideration of industry problems has developed in the trucking industry to a far greater extent than if federal regulation had not been enacted is in itself not especially disturbing. Trade associations are common in American industry and perform many useful functions. However, truck rate bureaus have played such a significant role in minimum rate regulation that special attention must be given their activities in any realistic study of the regulatory process. Many user groups and some official bodies are already critical of government encouragement to cartelization. This attitude is supported by such facts as the Commission's actions in prescribing the rates proposed by the strongest rate bureaus as reasonable minima in territorial minimum rate cases and continuing to prescribe minimum rates after the expiration of the emergency situations of the 1937–38 recession. Moreover, in frequent suspension cases the Commission has found unlawful the reductions in individual rates proposed by individual carriers but opposed by rate bureaus and other groups.[94] Nor are recent evidences that organized motor carriers are revising their tariffs to make their rates identical with or above rail rates and more in accordance with the value of service principle of rate-making encouraging to those who place their faith in competitive controls.[95]

Restriction of Independent Action

A direct result of the pronounced growth in industry organization by motor carriers has been a material reduction in the independence of the individual firm in making rate adjustments and in other competitive activity. This result has also been contributed to by regulation of minimum rates. Increased group action in regard to the direction, timing and magnitude of rate changes has been substituted for the high degree of independence enjoyed by the individual carrier under unregulated competition. Today the decision of an individual carrier to cut a rate or change a classification to lower freight charges must commonly run the gauntlet of criticism by his competitors and meet the test of majority approval in a rate bureau. If not approved by the standing rate and appeal committees of his bureau, the individual carrier can proceed to file under his individual filing rights after giving the bureau proper notification. But in these cases the rate bureau will ordinarily request the Commission for suspension and oppose the individual carrier's proposal in any regulatory proceeding that may follow.[96] The filing carrier must then defend his proposed reduced rate according to the Commission's tests of a reasonable compensatory rate and bear the burden of proof (since September 18, 1940) in the contest with his carrier opponents before the Commission.

Many rate changes, though desired by individual carriers, never go beyond the rate bureaus. How many rate reductions are thus thwarted is not known, but a tabulation made from the Disposition Advice Notices of the Middle Atlantic States Motor Carrier Conference appearing in a year's issue of *Transport Topics* is revealing as to the effect of bureau activity. For the

[92] For reports of the addresses of John L. Rogers on this subject to groups of operators in the formative period before and immediately after initial rates were filed under the Motor Carrier Act, see issues of *Transport Topics* for Oct. 21 and Dec. 2, 1935; Feb. 3, May 18, Oct. 19, 1936; and March 29 and April 12, 1937.

[93] Mr. Rogers is reported to have urged truckmen to get together in the interest of uniformity of rates before a meeting of truck operators in Hartford, Conn., as follows: "The Commission wants to work with the industry and wants to work with you operators and wants to work with the public and the shippers, *but we can't work with the industry if there are 57 varieties of rates in the industry.* The result of that is going to be that if you folks don't get together yourselves in the interest of uniformity of rates, you may get by with it initially but a little later the Commission is going to have to prescribe them for you. I hope you will understand that I don't mean to be harsh, but we are going to have a rate base, and it isn't going to be different in every township. It is a time of give and take and I hope that you will not insist on holding out for purely local interests, but get together on this matter. If there ever was a time that the industry needs to get together, it is now." [Italics supplied.] *Transport Topics*, Dec. 2, 1935, p. 4.

[94] In some cases reductions proposed by particular carriers but opposed by rate bureaus have been found unlawful on the ground that the respondent did not bear the burden of proof that the reduced rate would be compensatory. Cf. Locklin, *ibid.*

[95] Note the strong and widespread opposition voiced by shippers to recent tariffs filed by the Central States Motors Freight Bureau having the general effect of putting motor freight rates on the rail basis. *Traffic World*, Vol. LXVII, No. 17, April 26, 1941, pp. 1053–55.

[96] For discussions of the procedure of motor rate bureaus, cf. *Motor Bureau Rate Procedure, op. cit.*, and Harry G. Williams, *Motor Freight Traffic*, 1939, pp. 189–190. The Commission summarized the procedure employed in the New England territory in 8 M. C. C. 287, 289, 290, 300, (1938) and that in the Middle Atlantic territory in 24 M. C. C. 501, 504, 505, 551 (1940).

year ended May 12, 1941, 1,024 individual rate proposals reportedly were disposed of by the Conference after first being docketed for consideration. Of these, 371 or 36.2 percent were not recommended and an additional 183 or 17.9 percent were withdrawn. Thus 54.1 percent of the proposals of individual carriers were rejected or withdrawn, and only 235 or 22.9 percent were recommended as proposed. As amended, an additional 184 or 18.0 percent were recommended and the remaining were either recommended in part or referred to an appeal committee. The significance of these figures is more apparent when consideration is given to the fact that well over 95 percent of the proposals were for rate reductions.[97] How many of those rejected or withdrawn were subsequently filed independently by the individual carrier is unknown, but the probability is that few were.[98]

When a carrier appeals from his rate bureau to the Commission by proposing a reduced rate on an individual basis, he cannot be sure of favorable action. For example, the Commission disapproved most of the 106 proposals submitted by individual carriers in the original decision in the *Trunk Line* case,[99] the greater proportion of which involved reductions under those proposed by the rate committee representing the Middle Atlantic States Motor Carrier Conference. How typical this may be of the disposal of independent actions in territorial minimum rate cases is not known, though the noticeable tendency by the Commission to accept the proposed rates of the dominant rate bureau as reasonable minima gives little reason to consider it exceptional.

[97] This was the estimate of C. M. Carter, chairman, Standing Rate Committee, Middle Atlantic States Motor Carrier Conference, given the writer on May 13, 1941.

[98] For one reason, any changes reducing rates would involve modification of the minimum rate order in *Trunk Line Territory Motor Carrier Rates*, 24 M. C. C. 501 (1940). The issues of *Transport Topics* for the period show that of 715 proposals docketed subsequent to this decision by the Middle Atlantic States Motor Carrier Conference for the remainder of the year taken, 482 or 67.4 percent would have changed the rates prescribed in this order. In these instances a carrier would have had to petition the Commission to reopen the case. Moreover, the carrier would know that he would be opposed by his bureau at hearings, if he did act independently.

[99] *Trunk Line Territory Motor Carrier Rates*, 24 M. C. C. 501 (1940). Of the 106 proposals by independent carriers considered, the Commission disapproved 87, or 82.1 percent, wholly approved 11, or 10.4 percent, and partly approved 8, or 7.5 percent. Most of those disapproved involved rates lower than the proposals of the organized carriers. It may be noted that the rate committee representing the dominant group opposed nearly all of the lower rates of the independents. On the other hand, none of the 11 independent proposals approved by the Commission were opposed by the organized group. The Commission based its disapproval in most instances upon a finding that the rates proposed were not reasonably compensatory, but it also mentioned such tests as disruption of present and proposed rate structures on particular commodities, insufficient justification offered, failure to benefit all carriers, and lack of necessity to lower rates to meet competition. This action presumably settled many of the rate proposals which had been docketed previously for consideration by the Middle Atlantic States Motor Carrier Conference.

The procedure of docketing rate proposals for collective consideration in rate bureaus also provides many opportunities for competitors or the majority to persuade individual carriers to go along with the group. The threat of organized opposition in suspension and complaint proceedings must frequently serve to discourage carriers from exercising their individual right to independent action in other cases.[1] Opportunities for reaching agreement are found even after rate proposals are filed. The transcripts of some of the motor carrier suspension cases dismissed without decision refer to agreements having been reached between the carriers proposing and those opposing rate changes.

Rate bureau procedure may tend toward price leadership by dominant firms, for generally the larger carriers have been the ones most interested in organizing rate bureaus and committees. Such information as is available suggests that the larger carriers may contribute a disproportionately large share of the revenue needed for the support of these organizations.[2] Where this is the case it would not be unreasonable to expect that the larger carriers might confront less difficulty in securing favorable and quick action upon their rate

[1] A Harvard graduate student, Mr. Dayton W. Hull, whose field fellowship in 1936–37 permitted him to spend several months in the offices of A. T. A. and the Southern Motor Carriers Rate Conference to study truck rate making and to participate in rate conferences, commented as follows: "Besides this bureau naturally has some psychological influence. Personal conferences smooth many threatening situations. Another influence the bureau has is its recourse to trained legal counsel to back up a threat to petition the I C C for suspension of a proposed rate. If the petition is made by a responsible bureau the Commission is quite likely to hold an I S S hearing where the whole basis of the proposed rate can be exhaustively probed. An operator must be well prepared to defend his rate in order successfully to complete such a hearing." *Federal and State Control Over Freight Rates in the Trucking Industry*, unpublished doctoral dissertation, Harvard University, April 1, 1938, pp. 70–71. Stronger evidence of the power of rate bureaus may be gleaned from the following quotation from the Commission in *Rates between Arizona, California, New Mexico, and Texas*, 3 M. C. C. 505, 510 (1937); "To inform the Commission as to rate conditions, the Conference lines filed formal complaints attacking the rates of five independent lines operating in this territory, on the ground that they were 'out of line' with those of the Conference lines. As the result of negotiations before the complaints came to hearing four of these lines agreed to revise their rates upward to conform substantially with those of the Conference lines, and a set of fairly uniform truck rates was published to become effective October 1, 1936, and to expire April 30, 1937."

[2] The question of dominance of the Middle Atlantic States Motor Carrier Conference was raised in the hearings in the *Transport Company* case. On this point the testimony of Dabney T. Waring, General Manager of this Bureau, was reported as follows: "Nineteen of the 427 members of the conference were shown to be interested in the proposed merger * * * 9 of the 25 directors of the conference, it was shown, were vendors * * * Mr. Waring said that unless the present rule of the conference were changed the merged company could not have more than one member on the board of directors, unless the present corporate identities were preserved * * * *The fact that seemed to be deemed important in this phase of the case was that the 19 vendors constituting a small percentage of the membership, in the 3 spring months of 1939 and 1940, contributed about 27 percent of the revenues of the conference, dues being based upon the volume of business.* Mr. Waring, in answer to a question by Mr. Klein, said he preferred not to make public the precise amounts paid by each of the vendors." [Italics supplied.] *Traffic World*, vol. LXVI, No. 3, July 20, 1940, p. 166.

proposals.[3] Since the proposals of leading bureaus have been prescribed by the Commission as reasonable minimum rates for all common carriers in the large territorial rate cases, price leadership by those who dominate these bureaus is obvious.

The impairment of the independence of the individual firm under rate bureau procedure is likely to increase as a result of the Commission's tendency to cite rates contained in rate bureau tariffs as reasonable minima. The non-bureau member is confronted with two alternatives: (1) He may undertake to select from the cited tariffs the rates for his particular traffic movements for independent publication, since established minima tend to become actual rates;[4] or (2) he may join up in order to participate in the bureau tariffs to which official reference is made. But since the small carrier is not well equipped for building his own tariffs expertly, he often finds it to his advantage to accept membership in the appropriate bureau. It is reported that certain rate bureaus have experienced an increase in membership as a result of territorial orders establishing rate floors. Large membership affords an increased opportunity to secure uniformity of rates and to avoid individual rate cutting.

The dependence of organized groups in the motor freight business upon the Commission in making collective action effective is indicated by the Commission's own comment in *New England Motor Carrier Rates:*

> It is clear that the motor common carriers in New England have labored valiantly * * * to bring about some stability of rates, through a process of organization and joint effort intelligently conceived and faithfully carried on over a period of many months. Much of value has been accomplished, *but the desired stability is still elusive, principally because the degree of cooperation * * * has not been sufficiently complete. Disaster threatens, and the only remaining recourse is to the power of the Government.*[5] [Italics supplied.]

The Commission responded in this and other territorial cases by invoking the force of law to establish a firm foundation for the rate floors agreed upon by the majority of carriers. It has also made use of its suspension power to block rate reductions by individual carriers.[6]

Concerted action upon rates is apparently developing to some extent in the case of motor-rail competition, too. Tacit understanding or express agreement between organized motor carriers, freight forwarders, and rail carriers seems to have beeen involved in simultaneous increases in certain keypoint class rates in Central Territory which were sanctioned by the Commission in 1940.[7]

It is interesting to note that the entire plan to increase rates in this instance depended upon the cooperation of the Commission in raising the already established floor under motor rates for common carriers.[8]

One of the early motor rate cases provides an interesting example of the control of motor-rail competition that can emerge from group activity in the motor carrier industry encouraged by minimum rate regulation.[9] Increased competition from motor carriers in the southwest after 1928 stimulated the railroads to introduce a system of flat rates and to reduce both their less-than-carload and carload rates from Los Angeles to Phoenix. Soon after the Motor Carrier Act was passed the Interstate Freight Carriers Conference, a group of motor carriers organized in 1932,[10] and the railroads held conferences to consider mutual rate problems. The result was an understanding to revise rail and motor rates upward and to place them on a uniform classified basis.[11] With competition restricted in

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[3] Hull observed that the small operator not only does not participate as a member of appeal committees composed of truck operators but that he confronts difficulties in getting his rate proposals approved. He writes: "This justification would be strengthened were there not inadequate representation for the small operator. Committee members pay their own expenses and come long distances, so that the larger operators are the only ones able to accept membership. Naturally, proposals benefiting small operators—usually lowering a rate—are hard to put through." *Federal and State Control Over Freight Rates in the Trucking Industry, op. cit.*, p. 67.

[4] According to Commissioner Eastman "* * * in practical effect these minimum-rate orders have come to be regarded as maximum-rate orders as well * * * We have ordinarily thought of a zone of reasonableness marked by a minimum at one end and a maximum at the other. Here what is being done, so far as practical results are concerned, is the fixing of exact rates * * *" *Trunk Line Territory Motor Carrier Rates*, 24 M. C. C. 501, 628 (1940).

[5] 8 M. C. C. 287, 319–320 (1938). Cf. also comment in *Trunk Line Territory Motor Carrier Rates*, 24 M. C. C. 501, 504, 515–16 (1940), and *Central Territory Motor Carrier Rates*, 10th Supplemental Report, 21 M. C. C. 473, 474–475 (1940).

[6] For example in referring to prior actions by itself to bolster rate stabilization in the New England territory, the Commission said: "In *New England Territory Commodity Rates, supra*, we referred to the critical condition of the motor-carrier industry in the territory hereln, attributable to competitive rate cutting. A further lowering of the rate level was prevented in the fall of 1937 by our action in suspending numerous reductions in rates, which were found unlawful * * *" 8 M. C. C. 287, 289 (1938).

[7] Cf. *Central Territory Motor Carrier Rates*, 10th supplemental report, 21 M. C. C. 473, 487 (1940).

[8] This was recognized by the Commission: "It is admitted, of course, that there is nothing to prevent any of the motor carriers from increasing their class rates to the rail level, but the bureau contends that the carriers will not take unified action in this respect and that such action would be impossible of achievement unless all carriers are required to establish the proposed rates as minima. That the carriers will not act in unity voluntarily is borne out by the fact that the petition is opposed by some of the carriers, both members and non-members of the bureau." *Ibid.*, pp. 474–475.

[9] *Rates Between Arizona, California, New Mexico and Texas*, 3 M. C. C. 505 (1937).

[10] The Commission noted the progress of this bureau as follows: "In spite of repeated efforts, beginning in 1934, no substantial progress was made in bringing other motor carriers into the Conference. When the new law was enacted, the prospect was more hopeful and the Conference renewed its efforts to induce all of the carriers to join it in the movement to stabilize the truck industry * * *" *Ibid.*, p. 509.

[11] This agreement was recounted by the Commission as follows: "At about that time a conference of representatives of the rail carriers and certain truck operators in this territory was arranged so that they might consider their mutual problems with a view to eliminating destructive competition and checking a rate war which was already in

this manner, it was possible for the railroads to restore, and motor carriers to introduce, a rate structure differentiated according to the value of service principle. Although this restoration of monopolistic pricing evoked vigorous shipper protests,[12] the Commission found the agreed rates "not unreasonable."

The restriction of independent action in the pricing of motor freight services signifies that a marked change in the character of competition in transport markets has taken placed under the present scheme of control. Fewer and larger firms and the high degree of organization stimulated by regulation have facilitated groupist domination of the pricing of motor-carrier services. Competitive forces continue to operate, but their functioning is now interfered with by industry groups and regulatory bodies to a far greater extent than before the recent extensions of regulation. The restricted freedom of the individual firm to effect rate reductions at will or at the desired time obviously tends to impair price competition. The force of potential competition is lessened when authority to begin or to extend operations is denied or made costly to obtain and when private carriers are not permitted to accept traffic for compensation on the back haul. To the extent that these competitive forces are restricted, rates tend to diverge in an upward direction from competitive levels. Since the ability to manipulate price arbitrarily is the essence of monopoly power, monopoly elements in transport markets have been increased by the subordination of individual to group action that has taken place. Moreover, service competition is replacing price competition, where minimum rates prescribed are the effective ones and to the extent that motor carriers and water and rail carriers agree on rates. How far these changes in the character and degree of competition will proceed in the future cannot be foretold.

Some restriction of competitive forces in markets for motor-freight service was anticipated. Prevention of "excessive" or "destructive" competition by minimum-rate control implies interference with the right of the individual firm to make rate reductions at will. Encouragement to the growth of large firms was foreseen and transport regulation has traditionally stimulated rate-bureau activity. These anticipated changes were believed essential both to a financially healthy industry and greater economy in the allocation and use of resources in transport. If the latter objective, the one of greatest interest to the users, is being realized under controlled competition, indications of lower costs and rates or improved service, or both, should reveal themselves. Thus the question suggests itself: What has been happening to rates, services, and efficiency in the past 6 years of expanded control? The discussion to follow will treat this subject as fully as readily available information permits.

Effects of Regulation Upon Rates [13]

It should not be surprising to find that motor freight rates tend to be higher under present regulation than under free competition. A stated objective of public control is to curb "destructive" rate cutting, and it must be difficult, indeed, to draw the line between such rate reductions and those to be regarded as beneficial. Restrictions placed upon new entries must lessen the force of potential competition and probably the actual struggle for traffic. Concerted action to prevent rates from falling or to raise them has been stimulated and supported by Federal regulation. Only if the larger firms encouraged by this regulation proved to be more efficient and economies achieved were passed on to users could this effect be avoided. Even so, it would take time for very large firms to develop and to realize any economies from large-scale operations.

There is little evidence that regulation has had the effect of lowering rates for motor-carrier service as a general tendency. The Commission has not prescribed lower motor-freight rates for a large territory, although at times it has permitted individual carriers to lower their rates upon proof that reductions desired are compensatory or otherwise lawful or when not opposed by other carriers. The tendency for rates to fall when tariffs were first filed in 1936 [14] was temporary. The frequent reductions in motor-freight rates to meet lower rates made effective by railroads may be attributed to a more aggressive attitude by the railroads rather than to regulatory pressure exerted upon truckers or to operating economies traceable to regulation. The recent upward modifications of many

progress. At this conference, general principles were discussed by the carriers and a basic understanding reached that the rates would be revised and placed on a uniform basis for rail and motor carriers. Subsequently, at various informal conferences of the two groups, the motor carriers informed the rail carriers of the progress made in the determination of the revised rates and the dates on which they would become effective." *Ibid.*, p. 511.

[12] Cf. *Opening Brief in Behalf of Protestants*, July 10, 1937, and *Reply Brief on Behalf of Protestants*, Aug. 9, 1937, filed in *Rates Between Arizona, California, New Mexico, and Texas*, by Calvin L. Blaine and Charles E. Blaine, Phoenix, Ariz., for the Arizona Corporation Commission, American National Livestock Association, et al.

[13] It should be reiterated that all comments on the economic implications of developments attributable to the present regulatory policy are subject to the qualification that reference is primarily in terms of the direction of the particular effect. Measurement is beyond the scope of this study.

[14] This was reported by the Commission as follows: "Our information is that the first result of compelling the motor carriers of property to publish and file their rates was to precipitate a downward movement in such rates. Competing motor carriers, of which there are a very large number, were by the publication given definite advice of what each was charging, and the natural tendency was for the rates to gravitate to the lowest level." *50th Annual Report*, Nov. 1, 1936, pp. 73–74.

motor rates to or above the rail levels point to a gradual lessening of such price competition.

Sufficient evidence exists to make it clear that motor rates on regulated traffic are generally being maintained at levels higher than those that could prevail under free competition. The general effect of the Commission's territorial minimum-rate orders has been to increase the motor-freight rates prescribed. But only rough indications of the extent of such increases can be given, since refinement would require an exhaustive study of tariffs before and after such orders went into effect. Substantial increases were noted as one result of motor-carrier regulation in a recent study made in the Bureau of Agricultural Economics.[15] Some additional information can be gleaned from the Commission's decisions. A traffic test was cited in the *Central Territory* case as indicating that the minimum rates therein prescribed would be 3½ percent above the rates in effect previously, the latter having just been increased about 8.5 percent on the average by voluntary action after the 1938 rail increases of 10 percent on industrial commodities.[16] Subsequently, increases were sanctioned in class rates between so-called key points (industrial centers) in this territory, although the percentage of increase was not stated.[17] Apparently, increases in commodity and class rates in New England have taken place, too.[18] It has been estimated by a rate-bureau official that rate increases of about 10 percent and of from 5 to 10 percent respectively were effected in Eastern Territory by minimum-rate decisions in the *Middle Atlantic* and *Trunk Line* cases.[19] Some of these increases have been wiped out by reductions to meet rail competition in important items of traffic, such as paper and candy, but it is doubtful that all have been cancelled. Even where territorial minimum-rate orders are not in existence, as in the Southern, Mountain-Pacific, and Pacific territories, the chances are that rates are frequently higher than they otherwise would be because of rate-bureau procedure and sustained suspensions.

The Commission also prevents many rate reductions filed by individual carriers from becoming effective. A tabulation [20] of 193 investigation and suspension cases decided by the Commission between January 1, 1937, and November 12, 1940, shows that of the 145 filings lowering rates, where a direction of rates was noted, 95, or approximately two-thirds, were denied by the Commission. Only 38 of these filings, or 26.2 percent, were granted in whole and 12, or 8.2 percent, were granted in part. On the other hand, of 13 suspended filings to increase motor rates, 8 were granted, 3 were denied, and in 2 instances some increases were allowed and others were denied.[21] In a large majority of these cases truck- and rail-rate bureaus were the chief protestants, while shippers played the role of sole protestant in only 3 cases. The obvious effect of official rejection of proposed rate reductions is to hold rates above the level that would have prevailed had the individual carrier been free to make his reduction effective at will or on statutory notice.[22] The fact that the

[15] In *Barriers to Internal Trade in Farm Products*, *op. cit.*, p. 53, it is stated: "Wherever Interstate Commerce Commission control over interstate trucking rates has been made effective, the tendency has been to raise the rates substantially and in many cases to make them roughly equivalent to railroad rates. Increased trucking costs during the last few years have been urged as one justification for this action." Cf. also Earl J. Zoll, Jr. "The Regulation of Motor Carrier Rates by the Interstate Commerce Commission," *I. C. C. Practitioners' Journal*, Vol. VIII, Nos. 6 and 7, March 1941, pp. 451–470 and April 1941, pp. 579–598. Zoll states: "To secure a general rise in rates the Commission made use of its power over the carriers' minimum rates and, as a result of several comprehensive territorial investigations into motor carrier rates, has issued minimum-rate orders fixing rates below which the carriers may not go," p. 453.

[16] The Commission reviewed this effect as follows: "The proposed area tariffs were the result of these meetings and are revisions of the present area tariffs designed to eliminate further inequalities and inconsistencies as far as it was deemed practical to do so, and further to increase commodity rates 10 percent over present rates on quantities of 10,000 pounds. . . . Such increases, however, were not made in all the rates, as in a large number of instances reductions in the present rates are proposed to meet competitive conditions. A check was made of 938 rates provided in the first 100 items of one of the proposed area tariffs to ascertain the extent that present rates are proposed to be changed therein. It was found that 20 percent thereof would be unchanged, 25 percent would be reduced, and 55 percent increased. About 84 percent of all the increases were on less-than-truckload quantities of less than 10,000 pounds. It was the testimony of a witness for the Bureau that tests made by application of the commodity rates to traffic handled by certain respondents indicates [sic] that the increases resulting therefrom would approximate 3.5 percent. Petitioner estimates that rates in the proposed area tariffs, on the whole, would increase the present rates about 3.5 percent. This, together with the general increases made, in accordance with those allowed rail lines in the *Fifteen Percent* case, *supra*, will result in a total increase of approximately 12 percent in the rates in effect prior to March 28, 1938." 8 M. C. C. 233, 240–241 (1938).

[17] These increases were described as follows: "Although the rates proposed by the bureau would cause some slight reductions in some instances, increases would predominate. The principal effect of the proposed adjustment would be to increase the key-point rates applicable on articles rated third class or higher. These increases range from 1 to 9 cents on first class and from 1 to 8 cents on second and third class, but the majority of the increases are 3 cents on first class, 2 cents on second class, and 1 cent on third class." Tenth Supplemental Report, 21 M. C. C. 473, 475 (1940). Opposition of certain motor carriers on the ground that no need existed for such rate increases in view of lower costs of handling traffic between key points was noted by the Commission.

[18] According to *Traffi World*, Vol. LXII, No. 8, Aug. 20, 1938, p. 332, "Commission officials said the increases in the commodity rates authorized in the New England decision could not be stated definitely. There was testimony that the proposed rates represented increases of from 1½ percent to 3 or 4 percent. These percentages do not include increases which may be made to align the rates with the Ex Parte 123 rail rates." Cf. also *New England Motor Carrier Rates*, Seventh Supplemental Report, 16 M. C. C. 499 (1939).

[19] 4 M. C. C. 68 (1937) and 24 M. C. C. 501 (1940), respectively. Estimates were given the writer on an informal basis.

[20] Made by Hunter Morrison, Division of Marketing and Transportation Research, Bureau of Agricultural Economics, as part of a study of motor-rate policies of the Interstate Commerce Commission (unpublished).

[21] Six cases involved applications for both decreased and increased rates and in 29 cases no direction was noted.

[22] Even so, the Commission's Annual Reports show that 52,979 tariff publications were filed by common carriers of property and passengers by motor in the year ended October 31, 1936; 63,516, 1937; 72,795, 1938; 63,573, 1939; and 65,411, 1940. For the same periods both requests for suspension of proposed changes in motor-freight

Commission acts pursuant to statute does not mitigate the effect of suspension procedure and sustained suspensions upon competitive pricing. The rejection by rate bureaus of many rate reductions proposed by individual carriers after discussion of their competitive impact[23] also tends to hold rates above the competitive level.

Another, perhaps the primary, effect[24] of minimum-rate regulation is greater stability of rates than otherwise would have been the case.[25] Even if all rate proposals by individual carriers ultimately went into effect, rates would be changed less frequently under rate bureau and regulatory procedure. Hull found that delay in alteration of rates was a primary consequence of bureau procedure, and that where necessary for the individual carrier to appeal and exercise his individual rights of filing, the time required was usually 8 months.[26] The above-mentioned tabulation of 193 investigation and suspension cases involving motor-freight rates decided in the period January 1, 1937, to November 12, 1940, showed long delays where filed rate changes were contested before the Commission. For example, 48.3 percent of 176 of these decisions, for which definite dates were available, required a period of over 6 months between the effective date of the proposed tariff and the end of the suspension period. The delays involved in securing modifications in areas where territorial minima have been prescribed are not known, but they must be significant.[27] Obviously, under such conditions rates must become more inflexible, unless carriers risk large penalties for violating the law by departures from field tariffs and prescribed minima. Rate changes would certainly be more frequent in an industry such as trucking, if managerial judgment were unrestricted by rate bureaus and regulatory action.

A third-rate tendency under minimum-rate regulation is greater uniformity as between carriers offering different services which nevertheless are substitutable when proper price differentials exist. The logical effect of citing the rates in the tariffs of the bureaus dominated by the largest carriers as reasonable minima for large traffic territories is to produce rate uniformity. The only significant escape from this result would lie in action by individual carriers to cut below prescribed rates,[28] for minimum rates tend to become

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rates and fares and the proportion of the total suspended increased. The number of such requests were 217, 682, 787, 1,144, and 1,380 for each of these years, respectively. The percentage of the total requests for suspension of rates actually suspended rose from a low of 16.1 percent in 1936 to 32.2 percent in 1940, with a high of 38.1 percent in 1938. Except for 1940, the percentage of requests which the Commission refused to suspend varied within a much narrower range, from 17.3 percent to 23.4 percent. The Commission appears not to grant liberally special permission to motor carriers to make rate changes upon less-than-statutory notice. Though only 18.6 percent of the 22,823 applications for such permission in the period 1936 to 1940 were denied, most applications granted were for the purpose of correcting technical errors in tariffs, complying with rate orders, or making changes of minor importance. It is difficult to evaluate data showing tariff filings, since there is no breakdown as to persons filing, direction of rate change, or other essential information. In any case it is likely that the more significant rate reductions filed in terms of traffic and revenues are contested. Moreover, as territorial minimum rate orders spread, the ability of individual carriers to file changes in rates lower than those fixed as minima will be lessened. In such cases carriers must first petition for the right to file such changes, as revisions must be made in outstanding orders if reductions are involved. It is understood that approximately 5,500 proposals for modification of outstanding minimum rate orders have been filed, most of which changes in rates would have become effective had those orders not been in existence.

[23] The following comment by the A. T. A. indicates the scrutiny given rate proposals and implies that rate-bureau procedure is effective in controlling individual action: "Before hearing on any docket, the proposals are carefully investigated by the bureau staff. This investigation covers a careful check showing a comparison of the rail rates and rates of other competing modes of transportation and the present and proposed motor carrier rates. Consideration is also given to the rates from and to points not covered in the application. Every effort is made to make this investigation as comprehensive as possible because no change in rate should be made until all information has been secured as to its reasonableness and effect it will have on other movements. *By this procedure needless suspensions are avoided* and expenses kept to a minimum." [Italics supplied.] *Motor Bureau Rate Procedure, op. cit.*, p. 2.

[24] According to Zoll, "The effect of these minimum rate orders, in short, has been not to freeze the rate structure, but rather to discourage rate cutting and to put reductions under a supervision by the Commission which is much closer than is practicable in the ordinary procedure under which changes in rates may be suspended for investigation." *Op. cit.*, p. 455.

[25] The Commission observed in its *52nd Annual Report*, Nov. 1, 1938, p. 83, that "A promising beginning has been made in the accomplishment of one of the prime purposes of regulation, that is the establishment of stable and reasonable rates * * * We believe that they [early territorial minimum rate orders] will furnish the foundation for the establishment of stable and consistently adjusted rate structures."

[26] He concluded: "The effect of the bureaus on the rate structure, therefore, is primarily to introduce delay in the procedure of alteration." This effect was found particularly true where the proposal of an individual carrier is disapproved through each step of bureau procedure before filing upon the basis of individual action is permitted. In the case of the Southern Motor Carriers Rate Conference, Mr. Hull found: "When publication is finally made on the completion of the circuit described, it has usually been 8 months since the proposal appeared. The shortest possible time before taking effect is approximately 94 days, for according to rules of most commissions a rate must be filed for 30 days before becoming effective." *Federal and State Control Over Freight Rates in the Trucking Industry, op. cit.*, pp. 70 and 69–70, respectively.

[27] The Commission has made it clear that it does not wish to freeze rates: "It is not intended to freeze the classification, rates, ratings, rules, or practices within the territory embraced by our findings herein * * * all parties should be afforded opportunity at any time to petition for amendment or modification of the order whenever necessar yand proper * * *" *Midwestern Motor Carrier Rates*, 27 M. C. C. 297, 319 (1941). Despite such expectations, the delays inherent in present regulatory procedure cannot avoid a considerable amount of freezing of established or existing rates. According to Commissioner Eastman "under the orders * * * no such change [in rates] can be initiated by a carrier, unless the order is modified. Hence, whenever such a change is desired, a formal petition must be filed, and we must take formal action granting or denying the modification sought * * * the practical effect has largely been to eliminate the statutory procedure even when increases in rates are desired, for carriers are apparently seldom willing to risk such an increase without protection of a corresponding change in the prescribed minimum." 24 M. C. C. 501, 627–28 (1940).

[28] In this case such reduced rates would have to be defended before the Commission, or the risk of violating filed tariffs by secret rate cutting would have to be accepted. In at least one case the Commission has held that a proposed rate is not unlawful merely because lower than a prescribed rate. *McCormick Transfer, Commodities in Massachusetts and New Hampshire*, 22 M. C. C. 385 (1940).

actual rates. Where minima do not become maxima, some variation according to service differentials might appear. To achieve rate uniformity, it probably has been necessary to raise the rates of the smaller carriers higher than the quality of their service or their costs would justify.[29] The encouragement to go along with the majority and the discouragement to individual action on rates under present regulatory procedure also tend to promote uniform rates.

The tendency toward greater rate uniformity seems to be working itself out substantially on the basis of rail rates. A widespread movement to adjust motor-freight rates to rail levels and in accordance with rail structures is under way.[30] Organized motor carriers have shown a strong disposition to adopt rail classifications as a basis for their rates, except in New England. When rails and motors are competing keenly, it is to be expected that the two agencies will tend to charge the same rates for similar services. However, large-scale efforts to stabilize motor rates on the rail basis and to return to a value-of-service rate structure could hardly be successful without some substitution of monopoly power for the vigorous competitive strife prevailing prior to the Motor Carrier Act.

A Critique of Rate Tendencies Under Present Control

The attempt so far has been to describe the rate tendencies taking place under regulated markets for motor-freight service. It is for the public to decide whether these tendencies are desirable ones for public policy to stimulate. However, some critical comment of a suggestive and exploratory nature directed to the more important tests applied by the Commission in prescribing or testing reasonable minimum rates is justified.[31]

In its territorial minimum-rate orders the Commission has generally approved the rate proposals of the dominant rate bureaus as reasonable minima for all carriers. The question is whether the Commission has been sufficiently critical of the claims made by the carriers for stabilized rates on higher levels. Since carrier motivation is clearly dominant in recent extensions of regulation, it seems reasonable to expect the Commission to proceed to invoke the minimum-rate power on this basis only when a clear case has been made that the whole public interest will suffer unless rates are stabilized at existing levels or raised. Otherwise official response to appeals for the use of this power would seem too favorable to the welfare of the carriers working concertedly and actively toward higher and more stable rates and too unfavorable to shippers and to carriers not wishing to go along with the majority or the large carriers.[32]

The Commission has held that the drastic use[33] of its minimum-rate power involved in its early territorial minimum-rate orders was justified by the emergency financial situations confronting the motor carriers petitioning for such governmental action. The rationale of the emergency condition offered as a basis for public action was simple. Rate cutting and increased costs had wiped out profits or even brought losses for most firms, a situation destructive to "sound economic conditions" in the industry. In time service would be impaired or become inadequate for public needs. Since the efforts of the larger carriers to control the situation had failed, the powers of government must be exercised against recalcitrant carriers and shippers seeking rate advantages by putting pressure on individual carriers.

Though a full examination of trends in traffic and operating expenses and of other facts of record in leading cases would be necessary to reveal fully the wisdom of the Commission's interpretation of such emergency situations, some comment can be made on the basis of facts from case records summarized in the Commis-

[29] Commissioner Eastman has raised a question in *Trunk Line Territory Motor Carrier Rates*, 24 M. C. C. 501, 601 (1940), regarding the tendency to standardize rates despite service variations between large and small carriers: "* * * I am not wholly satisfied that a uniform rate structure for all the motor common carriers in this territory is desirable and in the public interest. *There are many small carriers operating under peculiar or special conditions which may well justify substantial departures from a uniform basis.*" [Italics supplied.]

[30] This is described on p. 4 in the *Petition by the National Industrial Traffic League for Suspension and Investigation* of supplements filed by the Central States Motor Freight Bureau, Inc., effective April 29, 1941, as follows: "By concerted action, the organized motor common carriers in the entire territory north of the Mason and Dixon Line and east of the Rocky Mountains are flaunting these statutory principles and requirements by seeking to establish as the tariff rates of each and every motor common carrier throughout that territory, arbitrarily, the full rate basis currently maintained by the railroads * * * Such concerted program was initiated in conferences and meetings of the American Trucking Association, Central States Motor Freight Bureau, Middle Atlantic States Motor Carrier Conference, Mid-Western Motor Freight Bureau and other organizations, not as a bona fide movement in the direction of increasing rates * * * as a revenue measure, designed to produce needed earnings to meet alleged increased operating expenses, but for the avowed purpose of placing the trucking industry in a better position to get the Commission to suspend and eventually condemn widespread reductions in rates which it was anticipated the railroads * * * would publish in the early future * * *" Cf. also *Traffic World*, vol. LXVII, No. 17, April 26, 1941, pp. 1053–1055, and *Transport Topics*, issues for April 7, 28, and May 5, 12, 1941.

[31] Cf. Part 1, Section III, 1, this report, for a review of the declared bases of the Commission's policies in regard to minimum-rate regulation for motor carriers.

[32] It is unlikely that the carriers active in controlling the market would be primarily concerned with the larger public interest. They would, however, be limited in exerting pressure upon the Commission for governmental support of higher rates by fear of private carrier, unregulated carrier, or rail competition and by the ability of the traffic to bear higher rates.

[33] Commissioner Eastman stressed this characterization in his partial dissent in the *Trunk Line* case as follows: "This is, it is unnecessary to say, very drastic action, and quite unprecedented so far as our regulation of railroad rates is concerned." 24 M. C. C. 501, 626 (1940). This note of caution is noteworthy, since it comes from one of the most influential advocates of the theory of nearly uniform regulation by one body.

sion's decisions. First, emergency conditions of financial demoralization and rate cutting seem to have been continuous since the 1937–38 depression, in spite of improved traffic levels, higher rates, and improved earnings in the motor freight field. Thus a question suggests itself as to whether the Commission has given sufficient attention to the changed economic conditions of the last 3 years. Commissioner Eastman, a leading advocate of present policy, has raised the question whether an emergency still existed in 1940 in view of the improved earnings in 1939 and the winter months of 1940 as compared with similar periods in 1938.[34] Moreover, although the Commission said that cost data of record in *Midwestern Motor Carrier Rates* were too limited to permit drawing conclusions on this basis, it nevertheless prescribed minimum rates for the Midwestern Territory within the last year.[35] Second, the emergency situation found in the early territorial cases described conditions during a very sharp business recession. For example, in the *Central Territory* case the Commission based its findings upon data for 1937 and the first 2 months of 1938. The last 6 months of 1937 and the first 2 months of 1938 were recession months. Motor carriers naturally experienced a decline of volume and revenues along with other businesses in this recession. Low profits or losses in such a period were to be expected and in any case seem an insecure basis for continuance of minimum rates established with reference to depression conditions long after they have been replaced by recovery and prosperity.

The further comment may be made that the Commission apparently has relied very heavily upon statements of revenues, expenses, and earnings of the class I carriers (annual revenues above $100,000) in determining whether to prescribe minimum rates in territorial cases. In the *Central Territory* case, questionnaire returns from 200 class I carriers for 1937 and the first two months of 1938 were considered. These showed that this group suffered an operating loss of $434,832.94 in 1937 and $607,616.64 for the first 2 months of 1938 (normally slack months). No data as to the operating results of the more numerous and smaller class II and III carriers (revenues from $25,000 to $100,000 and less than $25,000 respectively) were cited in the report. Thus, unless the record contained data relative to class II and III carriers not cited in the report, it is questionable whether the unprofitable situation portrayed is closely representative of the condition of the entire industry in this territory.[36] Hence in prescribing the minimum rates for both large and small carriers, it would appear that the financial condition of the large carriers may have received too much weight by the Commission.

The industry average cost standard for fixing minimum rates is particularly defective as an economic guide when the average used is based upon the costs of the high-cost firms. For then an umbrella is held over the inefficient carriers. Competitive pressure from the more efficient concerns eager to expand their market by reducing prices is lessened, and other devices, such as dressing up the service and traffic solicitation, tend to be substituted. Such outlets for competitive activity frequently lead to increased rather than lower costs

[34] *Ibid.*, 625–631; also footnote 38, p. 206, *supra*. It may be noted, however, that the Commission recently denied petitions for a minimum rate order to increase numerous commodity rates in New England territory. It said: "We can take official notice of the fact that the tonnage transported by motor carriers in New England has increased substantially in recent months because of the activity in defense industries." *New England Motor Carrier Rates*, 30th Supplemental Report (Sept. 8, 1941), Mimeograph decision, p. 5. Welcome, though belated recognition of changed conditions is to be seen in the Commission's orders of March 26, 1942, requiring parties to the blanket minimum motor rate proceedings in Trunk Line, Central, New England, and Midwestern Territories "to show cause in writing on or before April 27, 1942, why the effectiveness of the orders heretofore entered in * * * [Ex Parte Nos. MC–20, –21, –22, –23] * * * prescribing minimum rates should not be suspended."

[35] In this case the Commission prescribed minimum rates for a large area in Illinois, Indiana, Iowa, northeastern Kansas, northern Missouri, and eastern Nebraska. As to the reliability of the cost data it said: "The respondents, with minor exceptions, offered no evidence of costs of operation. Certain shippers presented cost studies based on their own operations as private carriers. Reports prepared by the accounting section of the Bureau of Motor Carriers, based on * * * revenues, expenses, and income for 1937 and the first nine months of 1938 of 84 Class I carriers * * * were received in evidence. No conclusions can be predicated on the limited cost data available. 27 M. C. C. 297, 301 (1941). This order apparently did not raise rates, though it serves to prevent them from falling in part on the theory of financial demoralization. On p. 316 the Commission said: "The level of the rates herein proposed is in the aggregate on a lower basis than that prevailing prior to the hearings. If no remedial action is taken by us, the rate war will continue, *the financial condition of the carriers will become worse*, and the preference and prejudice between shippers and localities will be extended * * * *The evidence is conclusive that in order to improve the financial condition* of common carriers by motor vehicle in the territory under consideration * * * an order * * * is essential." [Italics supplied.] For references to lack of cost and financial data in other territorial cases, cf. *New England Motor Carrier Rates*, 8 M. C. C. 287, 301 (1938); and *Rates Over Freight Forwarders, Incorporated*, 4 M. C. C. 68, 75 (1937).

[36] The relative importance of class I property carriers as compared with the other two classes combined is shown for the country as a whole by the following quotation from a recent report by the Commission: "In 1939, class I property carriers represented 4.5 percent of the total number of intercity carriers subject to the Commission's general jurisdiction, operated 32 percent of the total power units, accounted for 44 percent of the total vehicle-miles, and carried 48 percent of the total tons. Conversely, class II and III carriers accounted for 95.5, 68, 56, and 52 percent, respectively." *Federal Regulation of the Sizes and Weight of Motor Vehicles*, *op. cit.*, p. 612. Moreover, on the basis of facts cited in the report in *Central Territory Motor Carrier Rates*, 8 M. C. C. 233, 238–239 (1938), it is clear that great weight was given the condition of very large concerns. A group of 13 of the 200 class I carriers was regarded typical, yet this group sustained a loss of $668,064.40 in 1937 as compared with an operating loss for all 200 carriers, including the selected 13, of only $434,832.94. Moreover, the average revenues of the 200 carriers were $440,245 in 1937 but $1,464,086 for the smaller group of 13 carriers selected as typical in part because "* * * they transport general commodities and have operations in substantially every part of the territory, some being large and other small." If small carriers were included to any extent, the larger carriers must have been very large.

in the long run. The Commission has held that it must base its findings in territorial minimum-rate cases upon average costs of all carriers rather than upon the costs of individual carriers,[37] and, as illustrated above, it seems generally to have relied upon the average costs and financial condition of class I carriers or selected carriers of this group. As slight evidence is available that these larger carriers are usually to be found in the low-cost group and some exists suggesting that frequently they are not, the question suggests itself whether the Commission has not based prescribed minimum rates in [38] territorial orders on a rather high industry average cost. In this connection it is noteworthy that it has usually been the larger carriers who have pressed for minimum rate orders and uniform rates. The smaller carriers have generally been less enthusiastic and frequently are the ones that actively seek downward modifications of the minimum rate orders. Though in part this interest in lower rates may be due to ignorance of costs, it probably reflects lower costs or that small carriers give lower quality services costing less to produce. In view of the lack of data for small carriers, it would seem judicious for the Commission to refrain from invoking the minimum rate power with respect to the traffic of large territories until the needed data are at hand or at least to do so only when the emergency is very obvious as in times of general business depression.

It is not possible to say definitely whether the motor freight rate increases effected by the minimum rate orders would otherwise have taken place to the same extent. Aggregate expenses of operation, other than those traceable to regulation, have increased since 1938, but revenues have also increased in response to the higher levels of traffic. Whether unit costs have increased generally is not known, although the better-load factors after recovery set in must tend to some extent to offset factors contributing to increases. If unit costs have increased, the chances are that the rate level would have tended upward without prescription of minimum rates. However, the fact that organized groups of carriers have exerted vigorous pressure upon the Commission for minimum-rate orders indicates that it is unlikely that rates would have risen as rapidly or as far as when supported by Government power.

Attention should also be given to the bases cited by the Commission in finding particular proposed rates unlawful. Perhaps the chief test of reasonableness employed has been whether truck-mile revenues from a proposed rate would be sufficient to cover average costs of some type, often the carrier's truck-mile costs. For our purposes it is sufficient to note that the historical average cost of the proposing carrier is commonly, though not universally[39], regarded as a significant test of whether a proposed rate is compensatory.

Such an average-cost basis is sometimes defended as an instrument to make competition work more effectively by reducing extreme rate fluctuations. But the Commission's rejection in numerous cases of contested rates that do not cover fully allocated costs does not necessarily achieve this end; downward rate fluctuations may be quite essential to proper adjustment in supply and demand. For example, the case of joint cost may be mentioned. The Commission has infrequently distinguished between situations involving joint costs, such as unbalanced hauls, and other situations when it applies the average-cost test. A random sample of 21 I. & S. motor freight rate cases involving the question of lawfulness of proposed rates based upon marginal costs plus something toward joint cost on the back-haul, reveals that the Commission rejected the proposed rates in 20 instances wholly or partially because the proposed reduced rates would fail to cover full unit cost, though the rejected rates apparently would adequately cover out-of-pocket cost.[40] Some of the reports in these cases contained traffic data showing clearly that traffic tends normally to be unbalanced. Economic pricing in such joint-cost situations requires that primary consideration be given to demand factors, not to cost. So long as a rate covers out-of-pocket costs and is as far above such costs as market demand justifies, it is economic and in accordance with competitive pricing under the circumstances. Such pricing would have the advantage of reducing excess capacity on the back-haul and of reflecting lower unit costs.

[37] In *Central Territory Motor Carrier Rates*, it said: "It is impracticable to prescribe rates based upon the costs of individual carrier or groups of carriers. To do so would only perpetuate the destructive competitive practices which now prevail. Necessarily, the rates which we prescribe are affected by cost and they must be based upon the average cost of all carriers handling the various kinds of traffic." Apparently doubting the adequacy of its cost sample, the Commission said in the next sentence: "We are of the opinion, however, that in this territory, at least for the time being, considerations other than cost must influence the level of rates which is to be charged by respondents." 8 M. C. C. 233, 256 (1938).

[38] Herbert F. Taggart found that industry-average cost worked out too high as a basis for minimum prices under the NRA. "All of the NRA experiences point to this conclusion. In every case, if the prices were fixed upon averages at the time they were adopted, they were substantially reduced as time went on. The reason is not hard to find. The average was too high. The minimum price immediately became the maximum, quite contrary to the only justifiable theory of a minimum." *Minimum Prices under the N. R. A.*, University of Michigan Press, 1936, p. 388.

[39] Cf. *Lindley Trunk Co., Commodities in Midwestern States*, 23 M. C. C. 705 (1940), and *Barbour Transp. Co., Inc., Commodities, Coffeyville, Kans.*, 22 M. C. C. 251, 253 (1940).

[40] The leading case is *Refrigerator Material From Memphis, Tenn., to Dayton, Ohio*, 4 M. C. C. 187 (1938). The principle here laid down has been referred to in many subsequent decisions. Cf. 4 M. C. C. 589 (1938), 12 M. C. C. 447 (1939), 17 M. C. C. 447 (1939), 18 M. C. C. 265 (1939), 21 M. C. C. 86 (1939), 22 M. C. C. 529 (1940).

Similarly, a rate no lower than fully allocated costs is not an ideal competitive rate in situations where excess capacity from under-utilization of a motor-carrier's facilities has developed from a shift in demand or over-expansion. Though differing from a back-haul situation in being a more temporary condition, the use of the average cost standard in this case would require minimum rates to be raised. Under-utilization increases the firm's average unit costs, but the higher rates required to cover fully allocated costs would only discourage market demand and add to under-utilization. It would be more economic pricing to disregard overhead elements temporarily by quoting lower rates, so long as they returned some contribution toward overhead by exceeding the firm's marginal costs. Thus, the firm's profits would be maximized or its losses minimized, and the rate would be permitted to have its fullest effect in stimulating demand and discouraging supply.

The great dangers of the program of minimum-rate control are that the minimum rates selected will be so high as to protect the inefficient motor-carrier firms and the railroads; and that stabilization will make rates too inflexible on the down-side when lower rates are necessary to pass on the benefits of new techniques, to adjust over-extended facilities, and to reduce excess capacity from unbalanced traffic. A prime defect of attempting to adjust supply and demand by rate controls is that rates based upon the requirements of a fair return do not disclose the condition of investment.[41] If the industry is overbuilt, such controls tend to hold an umbrella over all invested capital. In this case rates should be allowed to fall, even if the rate cutting may seem destructive at the time. However, where carrier motivation is dominant in public control, as it clearly is under present policies, the pressure exerted by industry groups for more stable and higher rates by minimum rate orders is likely to win out over consumer criteria. This is shown by the action of Division 5 of the Commission in placing the burden of proof upon the carrier proposing a reduced rate, even before this standard was clearly provided in the Transportation Act of 1940.[42] Thus, under this interpretation many proposed reduced rates were found unlawful where the carrier proposing the rate reductions failed to support them with satisfactory cost information, even though protestants apparently had not proved them noncompensatory.[43] The types of rate effects now taking place do not appear to bring advantages to shippers and consumers, except for the possibility of lower costs by lessening business risk from more stable rates and improved service in the long run. With direct user benefits so difficult to trace and data on profits and carrier financial condition so incomplete, it would seem wise for the regulatory body to proceed cautiously in recognizing the claims of the large carriers for Government implementation.

Effects of Regulation on Service

An attempt to state the practical implications of present regulation upon motor-carrier service is considerably frustrated by the lack of data and thorough studies of the problem. Thousands of certificate and permit cases would have to be analyzed, or a reliable sampling procedure developed. However, a few suggestive comments can be made.

First, some strait-jacketing of service into rigid molds is apparently resulting from limitations on routes, services, and commodities placed on particular carriers. This was illustrated when the Commission required that separation of regular and irregular-route operations be maintained even after two carriers were combined. This condition was referred to by Commissioner Porter as "regulation gone mad."[44] The limitation placed by the Commission in many certificates and permits that no back-haul traffic for compensation may be accepted by a carrier not having such traffic on the 1935 "grandfather date" and subsequently is another example of rigidities introduced by regulation.[45] Carriers securing "grandfather" rights to operate are also not permitted to haul commodities which they had been hauling subsequent to the effective date of the

[41] Cf. Harry L. Purdy, "The Regulation of Transportation Rates," *The Annals*, American Academy of Political and Social Science, Vol. 187, September 1936, pp. 57–67.

[42] Cf. Part 1, Section III, 1, this report.

[43] For example, cf. *Rates of Lambert Transfer*, 3 M. C. C. 651 (1937), *Rates Over Carpet City Trucking*, 4 M. C. C. 589 (1938) and *Confectionery and Shoes Over Reliable Transfer*, 11 M. C. C. 71 (1939). Later a majority of the whole Commission found that the Motor Carrier Act had not placed the burden of proof upon the carrier proposing reduced rates. *Consolidated Freight Company, Commodities from Flint, Mich.*, 21 M. C. C. 329 (1940). Following this decision reduced rates were more frequently approved in I. and S. decisions, for the protestant now had to put forward a real case against such managerial action.

[44] *B. & E. Transportation Co., Inc.—Purchase—Merchants Transportation, Inc.*, 36 M. C. C. 561, 561 (1941). Commissioner Porter said: "The distinction, however, which the B. & E. is required to observe forever and a day between the regular-route operations now owned and the irregular-route operations purchased is regulation gone mad. If, as a regular manner of hauling, the purchaser saves time and money and wasteful transportation by avoiding the congested city of New York, that is bad and is here condemned, but if he does so only occasionally so as to preserve *the superfine distinction between regular and irregular operations*, that is good." [Italics supplied.]

[45] For examples, cf. *Martin Adamek Common Carrier Application*, 16 M. C. C. 641 (1939), and *W. R. Holland and S. R. Holland Common Carrier Application*, 29 M. C. C. 50 (1941). In *United States et al. v. Carolina Freight Carriers Corp.*, decided March 2, 1942, the Supreme Court, through Mr. Justice Douglas, found invalid severe limitations upon specified points served, commodities hauled, and return-haul traffic placed upon the "grandfather" operating authority of an irregular route common carrier. Though upholding action by the Commission to limit the territory served, this decision reflects increasing public criticism of publicly-created rigidities in transport markets.

Act but were not hauling previously. To obtain relief in such "grandfather cases," public convenience and necessity must be proved in further proceedings. Many examples of limitations upon points served, commodities handled, and types of service offered that work against the inherent flexibility of trucking operations can be found in outstanding certificates and permits. Though such restrictions may be required by the Motor Carrier Act, they nevertheless seem incongruous.

Secondly, regulation is having the effect of restricting opportunities for shippers to provide their own private-carrier service. Formerly, private carriers having full loads one way but empty trucks in the reverse direction were free to take traffic for compensation to build up their load factor and reduce unit costs. Except where back-hauls in "exempt commodities" can be secured to substitute for regulated traffic, private carriers cannot so easily continue this practice.[46] They now have to secure operating authority to carry for compensation. But the Commission has frequently denied certificates or permits to applicants who wished to engage in new or "late-grandfather" operations, if they intended to engage in private carriage also.[47] This policy is justified as necessary for the protection of essential common-carrier service. Where impairment of common-carrier service is not found to be threatened significantly, dual operations involving private carriage have been permitted.[48]

Third, the number of carrier alternatives available to shippers on given routes must frequently be less than when new operations could be freely established. Many applications for authority to operate are denied under a system requiring the applicant to accept the burden of proof that existing services do not satisfy the public convenience and necessity.[49] Curiously, the promise of lower rates from a new operation has been held not to be a factor in determining the adequacy of existing service.[50] This suggests that legal concepts tend to be substituted for economic ones in authoritative decisions on entries, for the price at which service is offered is certainly a factor in demand. Ordinarily, buyers prefer to have as many sellers as possible from which to choose.

Improvements in motor-carrier service could be a possible offset to higher rates under regulation. This would follow if all shippers prefer such improved service at the higher rates to lower-quality service at lower rates. Some shippers undoubtedly do display such preference. Others probably do not. Under unrestricted competition in the trucking industry some carriers would specialize in catering to shippers desiring a specially high-quality service and willing to pay for it. Other carriers would give a more standardized service to shippers preferring a lower-cost service. Both types of service would be available in the market to shippers. If the rate differences for the different grades of service should become out of line, substitution would occur to correct the relationships. On the other hand, where minimum rates are established and the freedom of individual carriers to offer special rates is restricted, great market pressure will probably be exerted upon carriers formerly offering the inferior grades of service to match the higher-quality service of the carriers best fitted to give, or specializing in, quality service. Thus with uniform rates a tendency toward a more uniform service will set in, with the result that the range of service-rate alternatives open to shippers will be narrowed as compared to uncontrolled competition. Moreover, if greater effort were expended to sell service on a so-called quality basis, costs of all carriers might rise without significant improvement in quality.

Upon the basis of available data, it is not possible to state to what extent regulation has restricted the supply of truck service or to measure the effects of the restrictions placed upon back hauls, territories served, dual operations, or commodities and class of service. However, it is clear that the truck's inherent advantage of flexibility of service has been impaired in some degree by limitations placed upon certificates and permits.[51] In many instances such limita-

[46] Reduction of the radius of operation of the strictly private carrier, except where he can carry his own products out and bring back raw or semifinished products or other supplies for his own use, was recognized by the Federal Coordinator of Transportation as one of the probable effects of motor-carrier regulation. "Such a restriction is justified for the protection of the common carrier upon whom the general public must depend." *Regulation of Transportation Agencies, op. cit.*, p. 33.

[47] For example, cf. *Charles F. Geraci Contract Carrier Application*, 7 M. C. C. 369 (1938). It is Commissioner Eastman's view that combined private and common carrier operations should not be permitted except in very exceptional circumstances. See his dissent in *Brooks-Gillespie Motors, Incorporated, Common Carrier Application*, 14 M. C. C. 631, 633 (1939).

[48] *Ibid.*

[49] For example, cf. *Lloyd Coffman Common Carrier Application*, 3 M. C. C. 93, 94 (1937), and *Wirt Lee Spencer Extension of Operations—Common Carriage*, 29 M. C. C. 73 (1941).

[50] In *A. D. Paddison Extension of Operations—The Dalles, Oreg.* 21 M. C. C. 324, 327 (1940), the Commission said: "Although applicant was unable to state the rates proposed to be charged by him in the event authority is granted herein, *it is clear that the only benefit which might be derived by the shipping public from the proposed operation would be that of lower rates.*

On this record we are unable to conclude that there is any inadequacy in available rail-carrier and motor-carrier service. The difficulties confronting those who support the application lie in their inability to obtain coordinated service to interior points beyond The Dalles. Prevailing motor-carrier rates * * * are said to be too high. *Obviously, in deciding whether public convenience and necessity require the proposed operation, the question of rates is not in issue* * * * adequate remedy [for excessive rates] is provided in the Motor Carrier Act, 1935." [Italics supplied.]

[51] The Commission itself has recognized that the quality of service of a group of livestock haulers operating between Omaha and western Iowa has been lessened by limitations placed on operating authority:

tions must also increase the costs of motor-freight service. The gains to be derived by shippers from limitations upon operating authority are anything but apparent; they may be those associated with the concept of greater stability. However, information in regard to the character and significance of any improvements in service offsetting increased cost to the shipper is so scant that the entire subject should be studied thoroughly.

In conclusion, less is known about the transport tendencies and economic effects of present regulatory policy than is desirable. Nevertheless, information on this subject at hand today is vastly superior to that available to Congress and the public in 1935 when the first important step toward regulation of the entire market according to the railroad pattern was taken. Experience since then has revealed that fundamental changes in the structure of the motor-carrier industry and in the character of competition in transport markets are being stimulated. The direction of these changes has been stated as well as possible with available information. These structural changes and regulation itself have produced as immediate effects higher rates than otherwise would have prevailed and certain rigidities in service not to be found under free markets. Shippers and consumers can only regard such tendencies as being of questionable benefit, unless the regulatory process eventually brings lower costs or improved service, or both. The uncertainty of definite gains of this kind after several years of trial suggests that the central issues should be reopened for public discussion.

Alternative Regulatory Policies for the Future

The analysis and findings herein suggest consideration of the possibility that Congress may have taken the wrong direction in extending minimum rate and entry controls to motor and water carriers. The economic case for this policy falls short of a satisfactory degree of positiveness in overcoming the basic presumption that less, rather than more, Government control is in the public interest. The principal effects of these key controls upon the transport structure and rates and services revealed so far give cause for public concern. Accordingly, if an alternative exists to continuation of these innovations in present policy, it should be given serious consideration. A mere search for measures to improve administration of existing regulation will fall short of the mark.

The paramount problem is to determine which of two basic directions of policy should guide regulatory standards for transport in the future. On the one hand, the Nation could continue in effect the main features of the present scheme of regulation, with minor changes in detail and perhaps in administrative criteria. Such a course would imply that continued restriction of competition and free enterprise in transport is desirable and that only regulation of the entire market according to the same pattern is workable. On the other hand, Congress could adopt a policy of repealing specific controls which were designed to restrict competitive forces rather than to safeguard competition. Such a reversal in the recent trend would recognize that the transformation experienced in the character and extent of competition in transport has provided many markets where relatively free competition can serve as a dependable regulator and that in these cases only regulation for purposes other than to lessen price competition should be continued.

Criteria for Evaluation

It is universally agreed that transport regulation should promote and protect the public interest. Controversy arises, however, over the method by which this can best be accomplished. In part disagreement over method reflects different philosophies as to the groups who should receive the primary benefits of public regulation. But more frequently such difference in opinion reflects varying conceptions of the underlying facts of transport organization and the results obtained from operation of the system. Thus we may assume that the same final economic ends are usually held in mind. It follows that a uniform set of criteria for evaluation can be applied in appraising alternative methods.

Adequate service at the lowest necessary cost has usually been the primary economic objective of transport regulation. The accomplishments and potentialities of alternative regulatory policies should therefore be subjected to this test, which obviously implies that consumer rather than carrier welfare should be made the ruling consideration. The course promising the greatest achievement in practice toward realization of this end should be adopted. Perfection should not be expected of either alternative, nor should emergency needs be permitted to confuse the issue. Special problems of this kind should receive separate consideration as they arise in order to preserve a maximum degree of flexibility for public action.

The Direction for Future Regulatory Policy

The history of the important recent innovations in the regulatory structure and the economic tendencies

"In general, these carriers are limited in their operating authority to the transportation of specific commodities, and such authority is generally defined as being within a radius of a certain point, usually Omaha. The service which they offer is less desirable than that of the general-merchandise carriers because of the territorial limitations." *Midwestern Motor Carrier Rates*, 27 M. C. C. 297, 306 (1941).

now working out under present policy explain the paradox of the increase of regulation at the very time that competitive elements in transport markets were becoming stronger and more pervasive. Active and successful carrier agitation has fostered a governmental policy which, by closing free entry and setting minimum rates, is placing restraints upon the vigorous competitive elements in modern transport markets. But should the Nation sponsor, as it is doing now, the welfare of carriers as the most secure and inexpensive method of promoting and safeguarding the public interest in transportation?

On the basis of the foregoing analysis and the criteria here selected, relaxation of regulation at certain focal points, in combination with a greater reliance upon competition, seems a better direction for public policy than to continue in effect the present scheme of regulation. The results of a freer competitive functioning will fall short of perfection, but, on the basis of past experience, they appear to be distinctly superior to those now occurring under present policy. Continuance of current regulatory standards may provide certain values of "stability" in transport conditions, but the cost in higher rates, restricted flexibility, and variety of service, and loss of the stimulus of free enterprise to efficiency is too great. The practical appeal of retaining what has so recently been provided should not act as a blinder to the advantages of a policy of modification.

The benefits that will flow from greater reliance upon competition as a regulator are well known in view of the recency of experience under active competition. The gains realized by the public when the free play of competitive forces was not conditioned by comprehensive regulation were widely acclaimed by users. Though significant strides have been made toward improvement in service and reduction of costs and rates, many shippers believe that the positive stimulus of active competition should continue unhampered.

Some of the more striking gains in the competitive era before 1935 may be recalled with profit. Adequate quantities of service, including many new and improved types, seem to have been supplied, especially in the motor-freight field. In particular, motor-freight service had attained a welcome flexibility of adaptation to the differentiated needs of shippers. The vast improvement in rail service and the numerous rail rate reductions stimulated by the tremendous development of inter-agency competition under comparatively free enterprise have been regarded by shippers as most satisfactory tests of the effectiveness of competition. Growing competitive elements proved indisputably more effective than government control in inducing the railroads to recognize changed general economic and transportation conditions. Greater and more numerous rate increases would undoubtedly have been placed into effect by the railroads during the depression had it not been for truck competition, though it must be recognized that regulation was also effective in this respect in some cases. The active competitive forces of this period exerted strong pressure upon carriers of all types to increase their efficiency. Railroads had to find ways to control their costs closely with declining revenues. In displaying remarkable success in this direction and in adjusting many rates downward, the railroads moved forward toward strengthening their long-run position. The high turnover in trucking attests to the effectiveness of competition in eliminating inefficient firms. The progressive decline in truck rates to meet retaliatory reductions in rail rates and the continued expansion in the range of truck operations reveal the forcefulness of competition in pressing for introduction of new techniques and improved management and organization. Moreover, the motor-carrier industry was sufficiently profitable to expand at a rapid rate in face of severe competition and depression conditions.

Some of these gains will undoubtedly continue to be realized under present policy, for though competition is being restricted it has not lost all its force. It is largely a matter of degree, with the balance of advantage in a policy of freer competition. The differential economic benefits which may be expected to accrue if certain key controls are relaxed to permit a more active competition may be summed up: (1) lower rates; (2) the maximum in flexibility and adaptability of service, particularly in trucking; (3) maintenance in full force of the pressures which motor and water carriers have exerted upon the railroads to improve their services, reduce their costs, and revise their rates downward; (4) the maximum incentive for efficient operations and respect for shipper needs throughout the transport system; (5) the maximum stimulus to experiment with new ideas and inventions, including the pricing of service. Moreover, full opportunities for the small business man will be safeguarded in the trucking industry, a field where small-scale business has persisted in competition with large firms, despite the "chaos" attributed to uncontrolled markets.

Certain vexing problems would remain to be solved under modified regulation, some of which would be intensified by the shift in policy. The problem of amelioration of the groups hit especially hard by revolutionary changes in the transport structure may be intensified. However, the rising volume of rail employment and the great improvement in rail profits in the present war boom period show that higher

levels of traffic from expanded production provide a far more secure aid to labor and investors than regulation of competing agencies. Even though the expanded demand may not continue, direct forms of amelioration of the social-security type will doubtless prove less expensive to the public than the indirect means of restriction of competition. The problem of the long-haul shipper by railroad, who may have to absorb a relative increase in transport costs as railroads hold rates on long hauls stable while reducing short-haul rates, may also be intensified. This difficulty, too, might better be overcome by more direct means, such as subsidy, reorganization of rail plant to eliminate wastes and reduce costs, and still further resort to highway and water facilities. The problem of securing a closer adjustment of demand and supply for transportation facilities will also remain, but it will not be intensified. That demand is fickle, with wide variations in level, is all too obvious. A large part of transport capital is not very divisible or adjustable in close relation with demand changes. Transport facilities provided by government are developed by complicated legislative criteria, not always designed to produce a close adjustment of supply to demand. Finally, the problem of cartelized control of the market by carriers would be intensified as compared with the period prior to 1935, though less difficult than under present government encouragement to cartelization in the trucking industry. Regulation of maximum rates and control of unifications, not control of minimum rates and entry, would be required to handle this situation. Revitalized anti-trust law enforcement, of which there are now definite signs, would also be helpful.

The Requirements of Equal Treatment

The alternative of continuing to rely upon comparatively free competition was given inadequate consideration in discussions of the need for extending control to motor and water carriers.[52] It was generally assumed that this direction for policy would require relaxation of rail regulation to permit the railroads to meet their competition without handicaps. The concept of equal treatment or equality of competitive opportunity came to imply either the same character of regulation for all agencies or the same freedom from control. This interpretation of the requirements for competitive opportunity was unfortunate, for its illusion of fairness had much popular appeal. Moreover, its implication that our 50 years of railroad regulation would have to be abandoned unless other agencies were equally regulated contributed to focusing attention upon the extension-of-regulation program rather than upon the advantages of active competition and the significant possibilities of relieving the railroads of any competitive burdens by administrative relaxation.

It seems strange that such wide recognition has been given the principle that equal regulatory treatment requires application of the same controls to all transport agencies. This theory overlooks the fact that the economic characteristics of each agency are unique in important respects, which in large measure accounts for the presence in varying degrees of the specific conditions requiring regulation to protect the public interest in each agency. The obvious fact that not all the services rendered by each agency are closely competitive with other agencies is also slighted.

To a large degree the validity of this interpretation of equal treatment depends upon the objectives and tasks selected for public control. If regulation is designed to prevent undue discriminations in rates and services and unreasonably high rates, the powers to control specific forms of discrimination and to prescribe maximum rates need be applicable only to the agencies having the economic characteristics enabling them to employ monopoly power significantly. Railroads and pipe lines clearly possess marked monopoly power. Much of the present regulation of these agencies is therefore appropriate to their economic characteristics. The complaints against motor and water carriers were not importantly directed either to their power to discriminate or to charge excessive rates, but rather to the destructiveness of unregulated competition to desired rates of return. If rails, motors, and water lines had displayed a disturbing tendency to act in concert on rate and service policies in the period before 1935, then uniform maximum rate and discrimination controls would have been essential to curb monopoly abuses.

[52] The railroads advanced the set of relaxation proposals to receive greatest official attention, but their suggestions seem to have been made for tactical reasons. Their program was to secure legislation extending comparable regulation to motor and water carriers rather than to seek means of implementing competition as a regulator. *Memorandum Containing Suggestions as to Needed Federal Legislation*, August 4, 1933, submitted by the Association of Railway Executives to the Federal Coordinator of Transportation. The Federal Coordinator discussed the rail proposals and the results of a questionnaire sent to interested parties on the subject in *Regulation of Transportation Agencies, op. cit.*, pp. 59-91. Though the Coordinator opposed relaxation as "in the teeth of experience," his discussion of the questionnaire responses revealed a very considerable receptivity, although no unanimity of opinion on specific items of relaxation, by shipper groups toward taking the alternative of leaving motor and water carriers unregulated and relaxing rail regulation where necessary to enable railroads to compete effectively. In its reply to the Coordinator's questionnaire the National Industrial Traffic League definitely recommended lessening of rail regulation and a policy of continuing to rely upon competition. The League, stressing the different economic characteristics of transport agencies, rejected the interpretation that equality of competitive opportunity requires "the same character of statutory provisions." *Federal Transportation Legislation*, reply of the National Industrial Traffic League to questionnaire, dated November 4, 1933, from the Federal Coordinator of Transportation, Nov. 20, 1933.

Uniform application of minimum rate and entry controls is necessary for protection of the public interest under two conditions, neither of which are to be found in sufficient degree to require this standard today. In the first place, it must be clear that restriction of competition to mitigate its effects upon carrier earnings is essential to maintenance of adequate service. It would be placing the cart before the horse to find a need exists for uniform minimum rate and entry controls because railroad control would be ineffective otherwise, until on other grounds it has been found that the public interest requires the restriction of competition. Without evidence of such a public need, it would be a matter of little concern that rail control tends to break down administratively. Where, however, this condition is found, the argument that regulation must embrace the whole competitive field to be effective has substance. But then no reason, other than impracticability or expediency, would exist for drawing a line between for-hire and private carriers in application of such controls. The competition of private carriers would tend to impair control of competition in much the same way as unregulated contract-carrier competition is said to impair regulation of common carriers or that of unregulated motor and water carriers impair the control of the market by the railroads, with or without the aid of Government regulation. In fact, this point has been recognized in current policy, for some restrictions have already been placed upon private carriers for the protection of the common-carrier system. If present policy is to be implemented more vigorously in the future, the strong possibility that further restriction of this kind would be sponsored to make regulation effective should be faced.[53]

In the second place, where objectives other than restriction of competition to protect carrier earnings prevail, it must be found that a specific need in each of the agencies exists for such other employment of the minimum rate and entry controls as may be warranted. Let us suppose that regulation seeks only to preserve the vitality and free play of competition as a market regulator, without heed to its general destructive effect upon inefficient carriers or agencies. Then only the carrier groups having the financial strength, cost conditions, and monopoly power conducive to their engaging successfully in competitive activities specifically designed to impair or destroy competition by driving out all competitors, by inducing them to merge properties, or by pressing them into concerted action would need to be regulated as to minimum rates. Since railroads still have much power to destroy competition, in their case either the minimum-rate power or some other safeguard, such as a provision that rates could not be raised if it appears that they were lowered to destroy the sources of competition, would have to be retained. Such limited use of the minimum-rate power should be insured by divorcing it from any objective to increase carrier earnings or to insure carriers a "fair return." Since individual motor and water carriers do not possess power to destroy their competition to a significant degree, the application of the minimum-rate power would not be essential in these fields. Nor would the failure to control the minimum rates of motor and water carriers while those of railroads were subject to limited control necessarily create untenable competitive conditions for the regulated carriers. It may be reiterated that during most of our regulatory history railroads were regulated differentially as compared with their water competitors. If this handicapped the railroads, such handicaps were regarded as minor and outweighed by the advantages of preserving the vitality of water-rail competition. In most cases railroads could be left free to meet their competition, as the Commission has generally permitted them to do in the past. In such competition they could not properly be permitted to go below their true marginal costs; rates would then tend to fluctuate around the full costs of their competitors, except where railroads definitely have a clear superiority from a cost standpoint. In such cases railroads would be free to take all the traffic, if their facilities were adequate. The high ratios of variable cost of the motor carriers and the knowledge that it would be unprofitable for the railroads generally to force rates too low are factors that would tend to keep rates on a generally profitable level, except in periods of recession when low levels of traffic prevail temporarily.

Entry control as to the rails is largely academic, since all important routes were long ago located and established. Because the public provides the highways and waterways, the significant items of investment in these fields, government already has the main investment problem well within its power to control. With adequate safety, financial responsibility, and highway regulations in force, there would be little real waste of misguided investment from entrepreneurial sources in a policy of allowing free entry in the provision of motor- and water-carrier services.

The point may be made that a residual regulatory burden might still fall upon the railroads under the suggested change to a policy of greater reliance upon

[53] Cf. The letter of April 3, 1939, from Commissioner Joseph B. Eastman to Representative Clarence F. Lea, Chairman, House Committee on Interstate and Foreign Commerce, giving the Commission's views "on the extent to which control over interstate transportation of property other than by common or contract carriers would be practicable and desirable." This expression of views was requested by Chairman Lea during discussions on bills introduced with reference to the Transportation Act of 1940.

competition. Rails would have to file rates according to statutory form and notice, adhere to file rates, avoid undue discrimination in changing rates, and at times would be prevented by minimum rate orders from lowering certain rates to meet competition. Admittedly, certain regulatory handicaps might accrue, but they can easily be exaggerated. In any case complete relief from regulation is not necessary to overcome them.

It is probable that the regulatory handicaps of the railroads in meeting competition of unregulated motor and water carriers have been overemphasized. The voluminous literature in which such burdens are mentioned reveals few facts on the subject. Of more significance are the evidences and further possibilities of administrative relaxation. It should be observed that the Federal Coordinator of Transportation has stressed the point that the Commission did grant the railroads considerable opportunity to meet the competition of unregulated carriers.[54] This was accomplished by a liberal policy[55] in granting rate changes on less than 30 days' notice, in allowing many rate reductions without hindrance from the discrimination prohibitions, and in acting upon requests of motor carriers for suspension (by suspending proposed reduced rail rates less frequently). However, where rails would be prevented from quoting rates designed to drive competing truck or water lines out of business by absorbing losses under marginal costs and securing undue relief from discrimination prohibitions, any regulatory handicaps involved would seem fully justified. Even so, they should be kept to a minimum. If it were to appear that the Commission had been overly restrictive of the competitive opportunity of railroads by such regulation, permission to lower rates can always be granted to alleviate the situation. This solution would hold to a minimum the difficult and more or less arbitrary judgments of how far to allow competitive rate cutting to go as compared to the cost standards now being applied in regulating minimum rates of all carriers.

The same requirements for filing and adherence to published rates could be applied to motor and water carriers, if sole application of these standards to the railroads would still handicap them under a liberal notice-of-change and suspension policy. Such standards would not be inconsistent with the new direction of policy. They might be useful in providing the basis for an informed competition and for the control of such personal discrimination as may be practiced. Any disturbing control of the market by rate bureaus and industry groups that would remain after removal of the supporting minimum rate power, could be prevented by application of the maximum rate and discrimination controls and active enforcement of the anti-trust laws.

Steps toward Modification of Present Policy

The scope of this study has been limited to a reexamination of some of the principal new features in public control of transport and the economic factors that should determine the proper direction for policy in the future. The leading revisions in the present regulatory structure indicated by the analysis will be stated to add concreteness to the conclusion that Congress should move in the direction of relaxing regulation in order to give competitive elements in transport markets freedom to have their full force and effect. This should stimulate public discussion of the problem and a more thorough investigation of the facts than was possible in this treatment.

If the change in the direction of transport regulatory policy suggested is adopted by Congress, some of the principal revisions that should be made in present regulatory policy are as follows:

1. Minimum rate regulation as now provided for motor and water[56] carriers should be repealed and should be used sparingly for railroads to prevent impairment of competition.

2. Control of entry into the motor and water carrier fields by means of certificates of public convenience and necessity based upon the adequacy of existing facilities or the effect of new operations upon the profits of existing carriers should be repealed. Any certification retained should serve as a device to enforce more easily desirable standards of financial responsibility for injuries and property damage and necessary equipment, driver, and maintenance standards to insure safety upon the public highways.

3. The powers of the Interstate Commerce Commission should be restricted to the control of rate and service discrimination and maximum rates; to the securing of joint rate and security arrangements to promote coordination where voluntary action by carriers

[54] Cf. *Regulation of Transportation Agencies, op. cit.*, pp. 60–62, 64, 69–70, and *Long-and-Short-Haul Charges*, Hearings before Senate Committee on Interstate Commerce, S. 1356 and H. R. 1668, Feb. 24–April 12, 1938, pp. 781–83.

[55] Cf. the Commission's annual reports for evidence of administrative relaxation during the period when motor competition was becoming intense. For example, the Commission granted an annual average of 87.5 percent of the less-than-statutory-notice rate changes applied for by railroads and pipe lines during the period 1930–34 as compared with 83.0 percent for the period 1925–29. The yearly average number of such applications increased from 5,748 in the earlier period to 9,921 in the later period, the one of most intensive interagency competition.

[56] Because regulation of water carriers as provided in the Transportation Act of 1940 has only recently been established, experience is too short for discussion of regulatory trends in this sphere. There is little reason to believe that regulatory trends and competitive results in water transport would be different in general effect, although differences in degree are possible.

fails to meet reasonable standards of efficiency in this area; the control of integration and securities in accordance with definite standards designed to prevent impairment of competition and investor injury; and the maintenance of a plane of competition which will prevent the railroads from engaging in competitive activities designed to destroy competition of other agencies.

4. Legislative notice should be given the transport industries that the tacit acceptance of rate bureau and other association activity for the purpose of fixing rates by dominant groups and carriers has been abandoned in favor of active enforcement of the antitrust laws. The recent attention given conspiracies and restraints upon competition in the transport field by the Antitrust Division of the Department of Justice is a step in this direction.

Modification of the regulatory structure along these lines would free competitive forces and press management to rely more upon itself and less upon the government. The primary task of regulation would revert to prevention of abuses of private monopoly power and impairment of competition. The allocation of resources in transportation and the relative development of the various agencies would be left to the collective choice of shippers on the basis of relative rates and service. This plan of control would necessitate finding some solution to the subsidy problem, either by removing subsidies to the competitors of the railroads, compensatory subsidies, or government provision of railroad right-of-way. With this problem solved, a competitively determined allocation of resources would be a tolerably close approximation of a truly economic one.

The present burdens upon Congress in handling the war program and pressing international problems may not make it possible to attend immediately to revision of transport regulation. Nevertheless, the minimum that should be done is to call a halt to further extension of regulation of the type provided by the principal controls and standards in the Motor Carrier Act of 1935 and the Transportation Act of 1940. Now that transport agencies are enjoying boom levels of traffic and considerable prosperity, immediate action should be taken to suspend the minimum rate power to prevent its further use as a device to raise the rate level on the theory that emergency situations of financial demoralization still exist. Action could profitably be taken also to suspend limitations as to commodities handled, points and routes served, and types of service offered in the certificates and permits of motor carriers in order to remove these regulatory obstacles to maximum use of existing facilities in a time when the need for transport supply is great.

Adoption of the modifications here recommended would not mean the complete abandonment of long-tested regulation in favor of unfettered competition as frequently assumed. Most of current railroad regulation would be maintained, but the Commission would be directed to administer its powers liberally in order to hold to the minimum any regulatory handicaps upon railroads in meeting competition of other agencies. The Commission intelligently adopted such administrative relaxation prior to 1935. Motor and water carriers would not be relieved of all regulation. States and the federal government would still retain control of the use made of the highways for protection of the public investment, promotion of the public safety and of the maximum use of the highway plant, and for the purpose of insuring third parties financial protection in case of injuries and property damage sustained in highway accidents. Any motor carrier whose operations were not sufficiently profitable to enable it to comply with reasonable safety and insurance standards could not continue in business. Motor and water carriers would be subjected to the same requirements of filing and adherence to rates as apply to the railroads. The maximum rate power and controls over discrimination would also be retained, though, except in cases of a very strong demand, it is doubtful that these controls would need to be invoked very frequently.

PART I—SECTION VI
2. THE NATURE AND CONTROL OF THE TRANSPORT MARKET

By Burton N. Behling[1]

The purpose of this chapter is to describe and analyze briefly the nature of the transport market and to consider the larger issues of public policy with respect to this market. The precept underlying this treatment is that public policy regarding the control or noncontrol of the complex transportation system should depend upon the characteristics of the market for its services.[2] Market situations usually have been referred to as either monopolistic or competitive, although it has been customary to make some incidental qualifications for the presence of the opposite market force. Thus, it frequently has been said that the railroads once had a monopoly, by which characterization apparently it was meant that the railroads collectively, and especially in view of their group actions, had the transportation field largely to themselves. More recently, evidences of competition have been more impressive, and consequently competition now is widely regarded as the controlling, if not sole, force in the transport market. The fault in this contrast is not that it is entirely without foundation, but that it is only partially true and therefore misleading.

The transport market can be treated here only in its broader aspects. Detailed analysis of particular problems in regard to rates, services, entrance and withdrawal of enterprises, costs, finance, obsolescence, and their regulation is impossible in a brief chapter. These fields are discussed in other sections of this study of the transportation problem.

Monopolistic Competition in the Transport Market

The present-day market for transportation service has many of the attributes of monopolistic or imperfect competition.[3] Conception of the transport market as either competitive or monopolistic is too simple; it overlooks the subtle nuances and shadings of these two primary market forces and results in confusion.[4] For this reason, a greater emphasis on the complex intertwining of monopolistic and competitive forces in the transport market should contribute to a better understanding of the problems of transportation policy.

In order to avoid possible misunderstanding, it may be desirable at this point to note that an abandonment of faith in competition is not indicated because its limitations are recognized. Competition, even though not "pure" and "perfect" in the technical economic sense, still may yield or can be made to yield a large measure of constructive results. Society cannot afford to discard economic tools and suppress forces simply because they are imperfect. Recognition of its deficiencies does suggest, however, that competition be regarded as a servant of limited qualifications; as a means, not an end in itself.

The mixtures of competition and monopoly which occur in transport markets cannot be expressed very exactly or satisfactorily in comprehensive terms. The conjuncture of forces varies not only with time but from one place or region to another, from one mode of transportation to another, and with respect to the movement of various commodities over varying distances. The most obvious and widely recognized generalization is that competition in transportation has become more pervasive and vigorous with the development of modes of transportation which rival the railroads. By some persons this seems to have been interpreted loosely to mean that the transport market in its entirety has become unqualifiedly competitive. While space limitations will not permit a detailed examination, it may be helpful to note some of the more significant economic characteristics of the several principal modes of transportation.

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[2] While a market must be composed of both buyers and sellers, issues of public policy and control are concerned principally with the seller's side. It is the latter aspect of the transport market that is considered here.

[3] For a detailed discussion of this point the reader is referred to the data at the end of this chapter.

[4] An example is the reference to the reluctance of rail carriers to establish open terminals as "selfish competition." Passing over the question as to whether such restrictive practices should be permitted, nothing but confusion of thought and policy can result from considering such practices as evidence of competition; beyond any doubt, they are monopolistic in nature and intent and as to result insofar as their purpose can be made effective. A similar error is found in the explanation of arrangements for the interchange of traffic between two carriers, and excluding others, as motivated by the desire of the participating carriers "to compete more effectively for traffic." Can there be any doubt that such devices are really directed toward a monopolistic advantage—an interference with free competition? Monopolistic arrangements as well as open or "free" competition are weapons of rivalry.

Insofar as the railroads considered alone are concerned, the nature of the market for their services, apart from the influence of regulation,[5] has not changed fundamentally since the original Act to Regulate Commerce was adopted more than 50 years ago. The outstanding economic characteristics are well known and need not be elaborated here. They include a high degree of competition at major centers; exclusive rail service at many local points; large aggregates of capital and considerable economies of size; very slow processes of attrition preceding abandonment; large common costs which are not strictly allocable to specific units or classes of traffic; recurring, if not chronic, underutilization of capacity in some or all facilities; a strong urge to attract traffic on almost any terms that are necessary; a differential rate structure which has received a large measure of sanction in the public interest; and concerted action through rate and traffic agreements. To state it bluntly, the market for railroad service is not purely or evenly competitive, it never has been, and consideration of the physical and economic characteristics of the industry reveals clearly that it would be impossible, without gross waste and duplication of resources, to make it even approximately so.

Carriers by water, in contrast with the railroads, do not bear the burden of maintaining rights-of-way. Their investment is devoted largely to floating equipment and usually in lesser measure to terminal facilities. The amounts involved vary greatly depending upon the size, age, and other characteristics of the equipment used and upon the services offered. Broadly speaking, costs are somewhat more variable in relation to traffic than for the railroads. Another important factor is that large shippers can and frequently do provide their own transportation by water. Governmental activities in the provision of rights-of-way, terminal facilities, and aids to navigation, as well as in the construction of vessels, have significantly affected this method of transportation. Because of the kinds of commodities which account for much of the tonnage carried by water, the volume of traffic is sensitive to fluctuations in general business, a circumstance which causes considerable instability and keen rivalry for tonnage, especially during periods of depressed traffic. Finally, although water transportation importantly influences transport rates and markets, frequently in areas far removed from the waterways, the competitive impact of this mode of transportation is nevertheless uneven and limited by physical and geographical conditions.

[5] In this section, the economic characteristics of the several modes of transportation which affect the forces in the transport market are considered, aside from the import of regulation.

The highway operators are not obliged directly to provide their own rights-of-way, and their tax contributions for this purpose are largely on a use basis. Trucking concerns of varying sizes are numerous in most areas and they offer services of varying scope. The alternative of private self-service by shippers and travelers is a strong influence on the market in both the freight and passenger fields. It should be noted that, in the paragraphs which follow, the purpose is to indicate the economic characteristics of motor transport, especially of freight, apart from the effects of regulation.

Operators for hire in freight service are still typically small, and it has not yet been clearly established whether there are appreciable over-all economies with increasing size beyond perhaps 50 or 100 trucks, although some rather large trucking organizations have developed successfully in recent years. Since investment and experience requirements are not especially great, there are no serious economic, as distinguished from legal, obstacles to entrance into the industry, at least on a modest scale. Likewise, the withdrawal from or the geographical shifting of operations is not fundamentally difficult, although lack of attractive alternative economic pursuits during periods of general depression impels operators to "stick it out" if they can in the hope for better days. Costs of operation are mostly, but by no means entirely, variable with volume. Lacking immediate economic alternatives, for example, many operators apparently are inclined to regard the commitment of their own services, in addition to their investments, as a "sunk" or constant cost element for considerable periods of time, and they seem disposed to act accordingly in their bidding for traffic.

To a considerable degree, the economic characteristics of highway transport, with reference to the operators rather than the roadway, are such as to make the industry somewhat more closely approximate the conditions necessary for the constructive functioning of competition, as usually conceived in terms of flexibility of supply and of numbers of operators acting independently, than is the case with respect to any of the other principal modes of transportation. It may also be said that motor carrier operations, more particularly for comparatively short hauls, blanket the country as a whole and permeate local areas more completely and evenly than do other modes of transportation.

On the other hand, the very fact that capital and experience requirements are limited, again disregarding the imposition of legal control over the right to operate, acts as a powerful attraction to potential truck operators, both when immediate traffic prospects are

bright and when other business and employment opportunities are scarce. Once begun, efforts to continue operations, often under unfavorable circumstances, frequently lead to desperate rate and other practices.[6] Many operators nevertheless have found it necessary to withdraw. The high rate of turn-over resulting from these conditions contributed, in the preregulation era, to an instability within the trucking industry itself, and as to the transportation system as a whole, which makes it difficult to regard the unrestrained competitive force of this mode of transport as entirely beneficent in its results. An additional complicating factor in the attempt to reconcile private and public interests in this field continues to be the problem of controlling the use of the highways with regard to congestion and safety.

As to transportation by pipe lines, it may be noted that their control is concentrated in the hands of a relatively few companies concerned with the production, refining, and distribution of petroleum or with the transmission of natural gas. Thus, it has been seriously questioned, and vigorously denied by the smaller oil-producing and refining companies, that the pipe lines are common carriers in fact as they are at law. The large investments of capital required, the risks of uncertain useful life, and the obvious wastes which would attend unnecessary duplication are among the fundamental economic factors, apart from the institutional, which limit competition within the industry. Moreover, where pipe-line transportation has proved to be definitely cheaper than movement by any other available methods, it is misleading to regard the losses suffered by former methods of transporting this group of commodities as evidence of effective competition. When one method has demonstrated definite superiority over another on a substantial scale, it is a case of technological displacement rather than competition, even though the struggle may have been extremely keen during the transitional phase. The same tendency toward a differentiation of function is discernible, though in a somewhat shadowy way, with respect to other modes of transportation. Thus, it is generally accepted that motortrucks have the greatest and clearest advantage in cost and service for relatively short hauls and that the railroads can better handle the long-haul traffic, especially where large volume and great bulk are concerned. Rate practices of the several types of carriers will largely determine, of course, how far this separative process will go and to what extent it will reflect economic differences in services and costs. But of all modes of transport, it will probably be agreed that pipe-line transportation is subject to a higher degree of monopoly than any other, within the limited field in which it has been found to be suitable. On the other hand, in some circumstances the transportation of petroleum and its products by tanker vessel is so much cheaper than it is even by pipe line that substantial competition by the latter normally is precluded.

Air transport is not only the newest method of transportation, but its potentialities are only dimly realized at the present time. As is usually the case when an industry is young and dynamic, indications of competition are especially strong, particularly since it must carry the challenge to other established types of enterprise in the same general field. Few will assert, however, that the development of air transportation could be left solely to unfettered enterprise with the expectation that the results would be satisfactory. If for no other reason, the requirement of safety and hence of fineness of organization in this naturally hazardous field makes it altogether unlikely that unrestrained competition would be an adequate controlling force in the public interest. It is not without significance that the air carriers strongly urged that regulation be imposed, and it is not indicated that their advocacy of Governmental control was motivated by objectives inimical to the public interest.

Air transport is headed toward great expansion. But it seems likely, nevertheless, to continue as a comparatively high-cost and limited service, that is, relative to other modes of transportation. And the number of commercial air lines which will operate in the same market or over the same routes will probably be rather narrowly limited also. For the latter reason, the industry may more appropriately be characterized as one of oligopoly or few sellers rather than of "free" competition; and the operators may be expected to act as oligopolists, that is, more nearly like the traditional monopolist, rather than as competitors in the absolute sense. The actual course which the development and organization of the air-transport industry takes in the future will, of course, depend importantly on policies with respect to the award of mail contracts, the issuance of certificates to operate, and the use that is made after the emergency of the greatly expanded capacity for plane production and of airports likely to be provided and enlarged for defense.

As noted previously, it is impossible to express the precise mixture of competitive and monopolistic forces existent in the transport market as a whole. The force of interagency rivalry for traffic is particularly complex and variable. Although it undoubtedly is true that competition has become both stronger and more widespread with the development of agencies rival to the railroads, the extent and consequences of the compe-

[6] For example, disregard for condition of equipment, long periods of driving, and other practices which increase highway hazards.

tition must be analyzed in the light of the circumstances involved in each market situation that develops an issue or issues which are of public concern. Determination of the public interest with respect thereto must be sought accordingly.

The Transport Market and Public Policy

Recognition of the increased pervasiveness of competitive elements in the transport market, resulting from the development of alternative modes of transportation, has led some observers to conclude that competition is so strong and effective that it can be relied upon to control the complex transport market in the public interest. Others have suggested that certain agencies, notably the railroads, require regulation but the rest do not. The latter conclusion is premised on the different economic characteristics of the several modes of transportation, some of whose distinctive features were outlined above. But this approach exaggerates the significance of the differences which do exist. It fails to recognize that the transport market is a complex, interwoven structure, with elements of monopoly and competition intermingled throughout the transportation system, and hence that a strictly categorical analysis is inappropriate. Most important, it overlooks the fact that the public interest lies in the functioning of the transport market as an interrelated whole.

As the transportation market has become more complex, it has become more evident, even though the reasons therefor may not always or in all respects have been fully articulated, that public policy with regard to a portion of the transport market may be thwarted or rendered largely ineffective if other segments of the market are ignored. This concept of indivisibility of the transport market problem has had to be applied to changing conditions in transportation, and there frequently has been considerable lag in meeting new conditions with altered public policy. But a literal reading of successive transportation acts is likely to give an impression of greater changes in basic transport policy than really have occurred.

This may well be illustrated by noting that regulation of transportation never has been directed solely to the control of either competition or monopoly *per se*. It seems to have been sensed, albeit somewhat indistinctly perhaps, that a policy based on such a choice would not have been attuned to the characteristics of the transport market, which is and has been a complex mixture of monopoly and competition. In this respect, there has been no really fundamental change in policy since 1887, although, to be sure, in evolutionary fashion, new tools have been forged and others sharpened both by legislation and its administration in response to changing conditions. The intermixture of competition and monopoly in transportation does vary with time, place, and circumstance; but conclusions derived from a concept of isolated and sharply separable spheres and eras of competition and monopoly are distorted. Elements of competition and monopoly are the Siamese twins of the transport market. Consequently, recommendations for and against regulation based on the identification of the market with one or the other and statements that regulation is or was intended or should be directed to the control of either competition or monopoly alone confuse rather than clarify the problem.

This avenue of approach indicates that a fundamental purpose of regulation should be to promote a market better adjusted to the public interest through influence upon the complex and dynamic mixture of competitive and monopolistic elements which is a normal feature of the transport market. Thus regarded, the pronouncement that the result of regulatory controls has been or must be to "limit" or "restrain" competition seems likely to convey a misconception both as to the nature of the market for transport and as to the objectives of regulation. It seems more appropriate to say that regulation is intended to supplement rather than supplant competition as a constructive force and to foster a more workable competition.[7] This point of view recognizes that the attributes of an uncontrolled transport market would not be such as to safeguard the public interest, but would produce extreme instability, gross discriminations, inadequate regard for safety, waste of resources, and ruthless competition interspersed with agreements, both outright and tacit, to live and let live. The motivation for the latter type of market conduct, it may be noted, would be the interests of those directly involved.

Governmental intervention by no means implies a disregard for the virtues of enterprise and controlled competition. The competitive principle still is a primary bulwark for a progressive economy and democratic society, and this is applicable to transportation as well as to other economic spheres. There continues to be an important place for freedom of action, even though its exercise must be conditioned by the nature of the market in relation to public objectives. The choice in any event is not between wholly beneficent competition and rigid control by a regulating authority blessed with supreme intelligence in the wise direction of every detail of the organization and operation of

[7] See Clark, J. M., "Toward a Concept of Workable Competition," *The American Economic Review*, June 1940, p. 241

the transportation system. Given two instrumentalities each of which has limitations, it would seem the part of wisdom to continue to rely on the eclectic principle that their combination may be expected to give better results than either a "free market" or governmental direction could produce separately.

Regard for the transport market as a whole is implicit in the objective of present policy to promote coordinated and economical use of transportation resources, and it is likewise expressed in the policy to develop and strengthen a national transportation system. Because of the reluctance of carriers of one type to cooperate with those of another in the interchange of traffic, carrier rivalry cannot be depended upon alone to yield the maximum potentialities of the facilities comprising the transportation system.

It is, furthermore, increasingly recognized that rate practices of the carriers are of fundamental importance in determining the spheres of operation of the various transport media. Thus, from the point of view of the individual carrier, freedom to employ a discriminating rate policy, adjusted to mixed competitive and monopolistic situations and designed to utilize facilities more completely, to decrease unit costs, and to yield additional revenues, can easily be shown to be desirable. But as a generalized policy followed by many carriers, subject to no limits other than the immediate interests of each carrier or type of carrier, it may lead to chaotic market relationships and wasteful duplication of facilities and operations, the over-all burden of which must be borne by the public in one way or another. If transportation facilities are excessive, the problem of confining the application of discriminating rates within reasonable bounds becomes especially difficult and the resulting excesses of both facilities and practices may not easily be corrected. It should be noted that more is involved in this problem than "fairness" and "equity" among the carriers; the more fundamental issue is economy in the use of resources for transportation, i. e., the rendering of a maximum of service to the public with a minimum of facilities and attendant costs. There will probably continue to be a legitimate sphere for the application in the public interest of a discriminating or differential rate policy; but it does not follow that the use of this device can be trusted unconditionally to private operators in the belief that their respective interests and practices will coincide with public welfare.

The proposition that the public interest extends over the transport market as a whole probably requires clarification if it is not to be misunderstood. It does not mean literally that the transport market of the nation must be regarded as a single indivisible entity in the analysis of most market situations and in the application of policies with respect thereto. There are many limited market situations; the market as a whole breaks down into a large number of more or less distinguishable submarkets that are essentially local in character. In other cases, large areas are involved; and occasionally issues are of national scope. Conditions will not be the same in all of these situations, broad and restricted.

This fact is of great significance in regard to policy, for it precludes the easy and uniform application of a few standardized maxims. Market situations vary with respect to mixtures of monopolistic and competitive elements therein, and discriminative policy should take account of such variations. As a general rule, each operator competes most strongly in each distinguishable market situation with a comparatively few rivals of the intra- and inter-agency types. This circumstance is reflected in the common reference by carriers, as well as by business men generally, to "our strongest competitor." Even where services are highly standardized and the total number of sellers or operators is rather large, the most influential market relationships in many cases are confined to rivals closest (in the economic but not necessarily in the geographical sense) to each other. There may be, of course, a chain-linking of markets with a spreading of competition through a series of groups, as with motor carrier "rate wars" and with what is commonly referred to as "market competition," most frequently with reference to the railroads. Perhaps the most significant observation of all is that generalizations as to the scope and effects of competition are unsafe. Each market situation requires careful analysis of its make-up. In transportation, however, it may especially be observed that the force of chain or wave relationships among individual carriers or carrier groups may be lessened substantially by selective discriminatory practices, either by localities, types of customer, or kinds and quantities of commodities.

Moreover, the entire market of each operator is usually divisible into parts, some of which are rather strongly monopolistic and others of which are predominantly competitive. The applicability of this proposition to railroad transportation, with reference to places, commodities, and lengths of haul, is evident. In highway and water transportation as well, competitive forces are not evenly blanketed everywhere or as to all types of commodities. If it were, there would not be such frequent references, for example, to the "pick-and-choose" practices of operators in the trucking field with respect to "fill-out" and "back-haul" traffic, although it may properly be noted that the differential rail rate structure provides a favorable environment for these selective forays. In general, the number of

intra- and inter-agency competitors tends to be greatest where the total volume of traffic is large and dense.

The idea that competition and monopoly are entirely separable and mutually exclusive forces in transportation markets is reflected also in the recommendation that public policy might be directed to the establishment of competition and monopoly each in those spheres where it apparently would be most effective.[8] Although public policy, to be sure, is certain to affect the proportioning of these two forces, i. e., the nature of monopolistic competition, in transportation markets, this view assumes that market forces can and should generally be made pure and absolute, all or nothing. It is a misunderstanding of the nature of transport markets to believe that these problems can be solved materially or generally or the public interest assured by some process of complete distillation of mixed and complex market forces.

A significant feature of public policy with respect to the transportation market merits attention at this point. Among other aims, the preservation of a reasonable degree of stability and orderliness has been an important aspect of public transportation policy at least since 1920, and more particularly during the extraordinary stresses which accompanied the depression after 1929. This desire for stability in transportation, based on a recognition of its key importance in the whole economy, must be given appropriate consideration in a well-rounded interpretation and appraisal of public policy and its administration in this field. Actions which may be taken amid highly dynamic conditions cannot soundly be appraised on the basis of assumptions relating to a static economy.

It is a commonplace observation that the transportation system in recent years has been subjected to severe dislocations incident to a combination of rapid technological changes and depressed demand for transportation service. The impact of these forces created a very chaotic situation wherein the struggle for traffic was extremely vigorous and likewise disorderly. The keenest economic struggles occur under such conditions, as new and old methods and agencies struggle for places in a market which, temporarily at least, is incapable of supporting them all in a complete sense. But it does not follow that the kind of competitive rivalry so induced will serve alone as a desirable controlling force in the public interest, for under such circumstances economical market relationships are not only rather blurred and indistinct but largely ignored by all concerned.

[8] This view seems to be involved especially in the more extreme recommendations that transportation rates should be based strictly on some process of cost calculation which would reserve each market for the most efficient carriers or types of carriers.

It is obviously very difficult to preserve a semblance of order and stability in the structure of the transportation market in the face of dynamic technological changes accompanied by great cyclical fluctuations in the demands upon the transportation system. The combination of technological advances, depression, resultant excess capacity, low earnings, and widespread financial impairment have focussed unusual, and perhaps even too much, attention on the control of minimum rates. But however this device may be regarded as an instrument of long-run policy, it should be noted that the recent emphasis upon it reflects an attempt to reconcile the conditions of the times with a significant aspect of public transportation policy; and minimum rate control should not therefore be assumed necessarily to portend or to require an ever-tightening grip upon and a progressive rigidity of the transport market.

It is well to recognize also that there are limits to what can and should be done to preserve order and stability in a dynamic industry which is a related part of the whole economic structure. Probably too much has been expected in the way of an embracive principle or formula which would govern the transportation industry. The transport market and competition within it undoubtedly would function better in a stable economy not subject to slumps in demand and fevered booms. The problem is how to maintain a transportation system that is reasonably orderly and healthy amid the changes of a fluctuating and dynamic economy. This is really only one way of saying that this major and complex industry requires, if it is to be continuously in sound condition, a large and rather stable volume of traffic. This requirement cannot fully be met by measures directed solely to the transport market and system considered by itself.

Regulation of the Transport Market

The foregoing sections have been concerned primarily with analysis of the nature of the transport market with reference to the public interest, rather than with the establishment of specific regulatory standards or with the presentation of a critique of the regulatory process as it has functioned over the last half century.[9] The purpose has been to focus attention on the characteristics of the transport market, to serve as a basis for the formulation and appraisal of public policy. Up to this point, therefore, the transport market has been considered with only casual reference to the effects of governmental policy in shaping to an important extent the character of that market in both the spheres of regulation and promotion. But inasmuch as this

[9] The latter issues are considered more specifically in another part of this report.

analysis of the transport market strongly implies intervention, especially as to regulation, it is appropriate to make some general observations with respect to the purpose and scope of and the general criteria for regulatory action.

A finding that the transport market is a complex mixture of competitive and monopolistic elements, and the resting of the case for regulation largely on that condition, naturally invites the inquiry as to whether every industry whose market is monopolistically competitive requires a comprehensive system of regulation to safeguard the public interest. The answer would seem to depend in part on the relative proportion of the competitive and monopolistic elements and tendencies, or stated differently, upon the effectiveness for the public interest of that degree of competition which does exist. Competition may be a workable principle or controlling force even though it may exhibit some deficiencies and limitations. The approach to this question has to be essentially pragmatic. Where the shortcomings of the competitive process are pronounced, further questions for consideration are whether intervention seems likely to do more good than harm and whether it is necessary to patrol the whole market in the public interest or only certain aspects of market action or only certain types of agencies operating in it.

These criteria applied to transportation point to the conclusion that a comprehensive system of regulation of the whole commercial transport market is necessary in the public interest if it is to function satisfactorily in providing a maximum of service (qualitative as well as quantitative) at low costs and charges and at the same time in maintaining the carriers as a whole in a reasonably sound financial condition. This view is strongly supported by the special importance of transportation, which has long been recognized as a key element in the interrelated structure of the whole economy and as an instrumentality of great strategic importance to national defense. The latter considerations also have emphasized in the public mind and among students of transportation the desirability of stability or orderly change in the transportation system.[10]

If the public interest is considered to require a measure of stability in this major field, it is evident that this feature of public policy cannot be entrusted to private hands. In fact, the preservation of relative stability, or controlled change, in transportation can be given sinister implications, with respect to checking of progress, of technological innovations, of service improvements, and of needed revisions of rate and financial structures, even when such control is exercised by a public agency. For example, it has been contended that the exercise of regulatory powers in certain instances has not been wise in permitting rail rates to be maintained or even increased in the face of a declining volume of traffic incident to depression and diversion to other agencies. It should be noted, however, that such decisions have had to be reached on the basis of incomplete data and limited knowledge as to the effects of different levels of rates; and these rulings have had to be made with due regard for the legal rights of carriers under private management to some exercise of judgment in attempting to obtain revenues to cover operating and capital costs as fully as possible during a lean period. It should be taken into account also that, in the absence of any regulatory control at all, the carrier managements would have been inclined, judging from the positions they have taken, to be more extreme in their application of rate policies which frequently have been criticized as short-sighted.

It cannot be denied, of course, that policies too strongly directed toward order and stability may unduly delay changes which would be desirable in the public interest. The issue involved is the eternal conflict between the relative social values of order and change, i. e., of deliberate and precipitate action in economic affairs. Exactly where the public interest lies in this matter is not possible of generalization, beyond the proposition that in a progressive society the burden of justification properly may rest on those who propose or impose barriers to changes which seem to offer favorable potentialities.[11] But on the other hand, while critics of the management and public control of the transportation system properly relate improvements in transportation with an acceptance of and adjustment to changing conditions, they go too far when they overlook that the achievement of a measure of order out of disorder may itself be regarded as a mark of progress insofar as it provides a more favorable environment for enterprise and competition, the commitment of

[10] Referring specifically to the railroad consolidation feature of the Transportation Act of 1920, although his statement has a broader application, Sharfman said nearly two decades ago: "This purpose is to remove, as far as possible, the chaotic conditions accompanying railroad ownership and control which are the result of almost a century of individualistic development; to substitute, therefore, within limits, an orderly transportation system; and to render possible thereby a fuller and more flexible utilization of railroad plant and equipment, and the provision of an improved transportation service. Concretely, many significant results are likely to follow. Rate regulation will doubtless be facilitated; costs of operation will probably be reduced; progressive inroads upon the domain of management will be rendered less necessary; and labor relationships may be improved." American Economic Review Supplement, vol. 14, No. 1 (1924), p. 70.

[11] The principle of orderly change, it may be noted, is not irreconcilable with the pronouncement of the Interstate Commerce Commission in a recent case that "we believe it to be neither the policy of Congress nor the proper function of this Commission to retard any form of progress in transportation *which will serve the public interest*." [Italics supplied.] Kansas City Southern Transport Co., Inc., Common Carrier Application, 28 M. C. C. 5, 1941.

capital, and the rendering of continuous service of high quality. To illustrate, the introduction of technological and other changes depends not only on incentives and competitive pressure but also upon the financial capacity to make them, and the latter would without much doubt have been even more seriously impaired if the transport market had been uncontrolled in the recent difficult period.

The foregoing observations may advantageously be applied to the matter of public policy in recent years with respect to what has commonly been referred to as an excess of transportation facilities. It is concomitant to far-reaching transitions in transportation, as well as in other economic fields, that the struggle between new and old methods and agencies in a dynamic economy will focus attention on a "transport surplus." This situation has been intensified by the concurrence, during most of the last decade, of a general depression, which in turn aggravated the rivalry for available traffic, and by the continued promotional activities of governmental agencies in stimulating the development of new techniques and facilities. The competitive struggle also has been sharpened by the reluctance of the operators of possibly obsolescent facilities to give in and to adapt their facilities, organizations, and rate structures to the changed conditions. While such resistance may create bottlenecks to progress and prolong dislocations, it also may be noted that such tactics constitute a strategy of delayed action, designed to gain time for clearer insight as to the best course to pursue. Those who have been impatient for a final solution of the transport problem, a doubtful expectation at best in an economic situation that is continuously dynamic, have been disposed to see in this resistance only a delay to progress and not a laboratory period in which the next steps in transport progress were being worked out in piecemeal fashion.

That our widely extended and haphazard transportation plant has recently been too large relative to the commercially effective demands upon it is a commonplace observation. But how much too large and in which particular directions and as to which types of transportation service is by no means wholly clear yet. Those who have favored or do favor practically complete and unfettered competition, insofar as that is possible in transportation, may well consider where the nation now might be in relation to transportation needs for the defense effort if an all-out war among transportation agencies or other drastic actions had been decreed through public policy in, say, 1932 or 1933 or 1938. Would the respective victors in the various sectors of the transportation market have established their inherent superiorities, licked their wounds of battle, and convalesced sufficiently to assume the transportation burdens now placed upon them? The answer may or may not be in the affirmative, but the significant point is that a definite answer cannot be given.

The same question may be raised in regard to the wisdom of forcing or encouraging a drastic curtailment of transportation facilities, directly or indirectly through regulations, in order to deal with the problem of a "transport surplus." The existence of such a surplus is much less evident than it seemed to be just a very few years or even months ago. This "surplus" phenomenon is likely to be a transitory one, since it is a function not alone of the amount of transportation facilities but of a fluctuating demand for them. Recent experience suggests that it may be sound public policy, if not carried too far, to temporize with some situations for a clearer light ahead. From this point of view, it also seems to be a more reasonable appraisal of regulation to say that it provides a cushion for severe shocks rather than a barrier to change. If the prevailing transportation policy of the nation has been interpreted correctly as emphasizing considerably the social value of stability and orderly change, then it follows that in the public interest the regulating agency may consider that it is expected to temporize somewhat in dealing with pressing issues of the moment. At precisely what point such tactics become detrimental to the public interest is a most difficult question. There also is certain to be sharp disagreement as to the application of such a policy to specific situations and issues. The danger, of course, is that this policy may unwarrantably be used as an excuse for inaction, extreme timidity, and undue resistance to change, or that it may have the effect of fostering an undesirable measure of concerted action among private operators engaged in transportation.

It has been stated previously that the public interest relates to the performance of the whole interrelated structure of the transport market and therefore that public policy should take as a point of departure the nature and functioning of that market. Obviously, governmental intervention itself is certain to affect the character and functioning of the market, and it follows that governmental policies and decisions should be as carefully analyzed and as critically appraised as the conduct of private agencies in the market.

The importance of this proposition is in no respect more evident than in the conflict between the regulatory and promotional activities of Government agencies regarding the transportation system. It has frequently been observed that these activities have not been very effectively synchronized; and this problem is considered in other chapters of this report. But

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while there is strong foundation for this criticism and while more attention certainly needs to be given the matter, it may be suggested that the undesirability of this conflict can be overemphasized. Promotion and regulation are both of necessity experimental in some degree. To contend that they should be perfectly coordinated with each other assumes that ultimate objectives and eventual results are known in a rather definite sense rather than being sought, and it presumes a much tighter centralized direction of transportation than many of the critics of governmental policy would be willing to accept. Noninterventionists would object to a Government regulatory agency closely controlling the technological innovations of private enterprise; and it may be argued that public promotional activities should not be so controlled either. While the failure closely to coordinate the two is logically inconsistent and while they sometimes work at cross purposes, since the promotional arm may hinder the adjustments sought by the regulatory hand, this may be a lesser evil than the rigidity and lack of venture which might be associated with a complete centralization of both regulation and promotion. Promotion by nature encourages change and innovation; a primary function of regulation is to establish some degree of order and justice in existing transport relationships. In this as in other conflicts between change and order, it is doubtful whether the sacrifice of one for the other should be risked for the mere sake of consistency. Nevertheless, it would seem advisable that those responsible for governmental promotion of transportation facilities have more consideration of the effects of their activities on the transportation system and market as a whole; and that they cooperate to a greater degree with those responsible for regulatory measures.

The conclusion presented here that regulatory powers over the complex and variable transport market structure need to be comprehensive enough to include all activities in transportation which importantly affect the market is in accord with the general nature of the powers prescribed in the principal acts pertaining to this field and especially with the recent extension of regulatory jurisdiction to highway and water carriers. The trend unquestionably has been toward acceptance of the proposition that the public interest requires that the administrators of regulation be equipped with a full kit of tools and further that the exercise of regulatory controls should be in large measure centralized. Even the most casual reference to the various acts to regulate transportation reveals that they are expressed in general terms of policy for the most part, and it also is evident that no one of the various policies or mandates can singly or separately be pursued where complex and multiple issues are involved.[12]

Probably the greatest misgivings with respect to the granting of such general and broad powers spring from the assumption that comprehensive regulation necessarily is synonymous with stringent or strait-jacket control. Consideration only of the evolution and extension of legislation pertaining to transportation, however, may give rise to undue fears in this respect and may lead to exaggerated inferences as to the stringency of regulation. The results of regulation must depend less on laws than on their application to specific situations and changing conditions. The law itself can only provide a framework within which the art of regulation can function. It is therefore essential to distinguish between regulatory jurisdiction to delve into all elements of the transportation structure as the need may arise, and authoritative and continuous management of the whole transportation system by a central public agency. It is, of course, difficult if not impossible to draw the line exactly. The revamping of the rail rate structure is a case in point. Criticisms of the regulatory process range from the contention that the effect of alleged strait-jacket regulation has been to halter and enervate management to the accusation that regulation has been delinquent in failing to require the railroads to adjust drastically and more quickly their historically developed rate structures in accordance with changed conditions.

But while the scope of regulation should be comprehensive, it is equally or even more important that the exercise of broad regulatory powers be circumspect and discriminating. The delegation of broad regulatory powers no more justifies their indiscriminate and unsparing use than the equipping of policemen with guns or billies assumes their reckless use in every situation. Hence, it may be emphasized again that analysis as to the effects of regulation which takes into account merely the terms of the laws to regulate trans-

[12] It is enlightening to consider the following declaration of national transportation policy which is contained in the Transportation Act of 1940:

"It is hereby declared to be the national transportation policy of the Congress to provide for fair and impartial regulation of all modes of transportation subject to the provisions of this Act, so administered as to recognize and preserve the inherent advantages of each; to promote safe, adequate, economical, and efficient service and foster sound economic conditions in transportation and among the several carriers; to encourage the establishment and maintenance of reasonable charges for transportation services, without unjust discriminations, undue preferences or advantages, or unfair or destructive competitive practices; to cooperate with the several States and the duly authorized officials thereof; and to encourage fair wages and equitable working conditions; all to the end of developing, coordinating, and preserving a national transportation system by water, highway, and rail, as well as other means, adequate to meet the needs of the commerce of the United States, of the Postal Service, and of the national defense. All of the provisions of this Act shall be administered and enforced with a view to carrying out the above declaration of policy."

portation must result in inadequate conclusions. This is so because of the necessarily general nature of laws which have to be administered under varying conditions and because of the fact that no one element of expressed public policy can be followed exclusively without being conditioned by others. It is for this reason that regulation must be in the truest sense an art which attempts to apply general mandates and principles that oftentimes are in conflict with each other.

It is precisely on this account that it can very easily be made to appear that there is inconsistency of policy on the part of the regulating agency over a period of time and in dealing with the "same" problem in different regions or localities. Close examination of all the facts and circumstances in each case may, or may not, reveal differences which justify dissimilar treatment or different weighing of the factors involved. It needs to be noted, in other words, that regulatory action in the complex field of transportation is not necessarily capricious because it is flexible, within the limits of the law, in its weighing of various criteria of the public welfare, or because it treads now lightly and then firmly with respect to one or another consideration. Perhaps a greater danger is that the regulatory process will tend to cast itself in too rigid a mold.

The same thought may pointedly be illustrated by noting that the transport market is comprised of various types of agencies the characteristics of which are in important respects distinguishable from each other. Recognition of this fact constituted the basis for the opposition that was voiced when the matter of application of "uniform" Federal control to motor carriers and later to water carriers was being debated. The argument that some agencies require regulation and others not overlooks the fact that the public interest attaches to the performance of the transport market rather than to methods of transportation *per se*, and that effective control of a part of the market may be hampered in important respects or even nullified if the rest is not also controlled. This fact does not require, as some have supposed or feared, that identical and indiscriminate control of all types of carriers be exercised or, for example, that the rates of other modes of transportation must be equalized with rail rates. But a rail rate structure which is molded in part by considerations of public welfare, and which seems still to require some application of the differential principle of charging, could not be maintained if others were completely free to follow their own inclinations and interests. The question is how rigorously the whole transport market and the respective segments of it shall be regulated, and the answer must be worked out in the controlled market for transportation services by degrees. It must be evident that the broadening of regulatory powers to provide for "fair" and "impartial" regulation of the several modes of transportation does not and cannot of itself yield a ready-made solution.

It may be noted that criticisms frequently are made that regulation favors certain special interests or agencies. Thus it is sometimes asserted that regulatory law and its application to transportation have shifted from protection of consumers to guarding the welfare of carriers. While this contention may have some justification, the contrast is apt to be too sharp because it has regard for only the conflicting interests of carriers and users. Rather than leaning too strongly toward any particular interest, however, possibly a more likely tendency is that a regulatory agency imbued with the highest motives may strive too much to be "all things to all persons." Confronted with pleadings from all directions in so complex a field, the regulatory influence may be dissipated in futile and sterile compromise. Or again, in order to escape the censure invited by the exercise of discriminating judgment, regulation may have resort to unduly rigid formulas which are much less "scientific" than their impersonal and uniform application implies.

The conclusion seems necessarily to be that transportation policy and its application to actual situations must be pragmatic and empirical in large degree rather than narrowly or rigidly doctrinaire.[13] Regulatory laws and their application, just as economic theories and doctrines, inevitably and properly develop largely out of the particular environmental conditions to which those who are responsible for them are exposed. Freedom of enterprise should be encouraged, but the public interest in transportation requires that some rules of the game be observed by all. Even so, in those circumstances where unfettered competition, imperfect as it is almost certain to be, works with reasonable effectiveness, it will probably continue to be prudent to let well enough alone. Contrariwise, where competition notably fails or is grossly wasteful, the public properly may exercise its voice.

Regulatory decisions, as well as the "natural" forces in the market, are certain to influence the complex character of that market, including the relative force of competitive and monopolistic elements in it. Since these questions of more or less are not reducible to neat formulas or universal agreement, the actions of

[13] It has been suggested that the next step may be to regulate the use of highways by private shippers who operate their own vehicles. Pending stronger and more conclusive evidence of the need in the public interest for this extension of control, however, the answer at this time would seem to be in the negative.

the regulatory agency or agencies will often be criticized as unsound, contradictory, inconsistent, and as giving too much or too little weight to this or that factor. While these criticisms, indeed, are likely to be well-founded in many cases, there is an obligation on the part of critics to take as broad a view of the public interest as the regulating agency presumably does. Public policy must be sufficiently broad in its outlook and application to compromise the conflicts frequently involved in various lines of policy and principle. Much of the misunderstanding of the transportation problem and disagreements as to policy and its administration derive from the tendency to direct attention rather exclusively to a single standard of appraisal, such as the beneficence of competition, the virtue of low rates, the evils of discriminatory charges, the desirability of technological change, or concern for the financial welfare of carriers. This approach represents the never-ending search for the all-embracing rule. It is well to remember that the flexibility which accompanies a measure of opportunism and expediency, using these terms in the better sense, has a value in the direction of economic affairs. No policy or formula can be expected to provide a cure-all for the intricate problems of a dynamic transport system which must function in a dynamic economy. And this limitation applies to the regulatory process. Like good physicians, regulators must rely greatly on their "patients" to help themselves and they will not prescribe the same pills for every malady, real or fancied.

DISCUSSION OF MONOPOLISTIC COMPETITION

The analysis of transport markets as given in this paper is closely related to recent developments in economic theory with respect to the "monopolistic" and "imperfect" nature of competition.

The fundamental postulate of the theory of monopolistic competition is simply that actual market conditions are seldom purely competitive or absolutely monopolistic. Therefore, it is the principal tenet of this theory that to analyze market situations exclusively in terms of one or the other force often leads to erroneous conclusions. Everyone who has concerned himself with such matters is aware of the common habit of referring to industries or markets as monopolistic or as competitive, depending on which force seems the stronger or on which particular aspect of market action is under consideration. Hence, the paradox frequently is presented that some observers describe a given market as competitive while others as firmly contend that it is monopolistic. Or again, practices are referred to as "cut-throat" competition which could not occur under conditions of genuine competition ("pure" and "perfect" —, in the technical terminology of economics) and are instead attributable to the monopolistic elements in the market. So it is with price discrimination, for example, whereby a seller, irrespective of cost differences, charges various prices in separable parts of the market or to distinguishable groups of buyers. In a strictly competitive market, there is no possibility of such action against buyers or rival sellers. It is the element of monopoly, or to use a crude but perhaps more effective expression, it is uneven competition of varying intensity which explains the power to levy differential charges.

As market conditions have become increasingly complex and as studies based on more complete data have yielded greater knowledge of market operations and price policies, it has been more fully recognized that assumptions of pure and perfect competition or of absolute monopoly are not well fitted to explain typical market situations. Competition to be pure requires that the number of sellers be sufficiently large so that the action of anyone, acting independently, would be so insignificant as to be negligible in its effect on the market situation, and further that the products and services of all the sellers in the market be standardized; i. e., have no distinctive characteristics significant to buyers in making their choices. In transportation, for example, pure competition would mean that there would be no differences in such matters as convenience, speed, safety, reliability, or other qualities of service, so that shippers would distribute their traffic at random among the carriers offering their services.

Strictly speaking, the seller in this case can have no policy with respect to price, for example; he can only "meet the market." The market of each individual seller is completely fused in the general market of which he is a part, and market forces are impersonal in their operation. By way of contrast, where the number of sellers in each distinguishable market is small and where product or service differences exist, monopolistic tendencies appear, and the individual sellers will tend to conduct themselves, either tacitly or by agreement, with consideration for the effect of the action of each seller on the general market situation and on the probable retaliatory measures of his rivals. The market and price problem for a limited number of sellers offering differentiated products or services and employing policies of discriminating prices cannot be fitted to the pattern of hypothetically ideal competition. (For further analysis of the market problem, where sellers are few or when products are differentiated, see Chamberlin, Edward, *The Theory of Monopolistic Competition* (1938), 3d edition, especially chapters III and IV. It contains a substantial bibliography of the growing literature in this field.) A leading British work on this subject is Robinson, Joan, *The Economics of Imperfect Competition* (1933). A still more recent presentation, from a somewhat different point of view, may be found in Clark, J. M., *Toward a Concept of Workable Competition, The American Economic Review*, June 1940. The following brief extracts from this stimulating article which have a particular bearing on transport markets and policy are noted: "* * * it seems probable that one of the criteria of workable competition is that there shall not be too gross discrepancies between the action of short-run pressures and long-run tendencies (p. 246) * * *. The most serious problems of imperfect competition seem, as already noted, to center in the fact that the immediate short-run pressures are out of harmony with the conditions of long-run equilibrium. And the starting point of a search for the conditions of workable competition seems to be the search for ways and means of reducing these discrepancies, under the conditions actually encountered (p. 249). * * * There is *prima facie* ground for the hypothesis that some forms and degrees of discrimination have a place in a scheme of workable, as distinct from perfect, competition (p. 250). * * * Actual competition has to make terms with the fact that, when demand fluctuates, industry must inevitably be operating short of full capacity much of the time. Workable competition must be workable under these conditions (p. 250). * * * It would be a truism to say that the most effective forms of competition we have, or can have, are imperfect forms, since there are no others. But it will mean something if we can find, after due examination, that some of these forms do their jobs well enough to be an adequate working reliance—more serviceable, on the whole, than those substitutes which involve abandoning reliance on competition. And it will be useful if we can learn something about the kinds and degrees of 'imperfection' which are positively serviceable under particular conditions" (p. 242).

Imperfections of competition, as distinguished from impurities, refer to those frictions, lags, and rigidities which impair free market action such as inadequate knowledge on the part of buyers, idle resources, excess capacity, which may be more or less chronic, continued operation of "submarginal" enterprises, and in general all delays or lags in the adjustment to changed conditions.

The theory of monopolistic competition endeavors to take into account such impurities and imperfections of competition in the formulation of a more realistic explanation of market forces and positions. To describe markets as monopolistically competitive, which no doubt seems a contradictory concept when judged in terms of traditional terminology, is not merely to play with words. It is based on the proposition that monopoly and competition are not mutually exclusive and, therefore, that a recognition of the concurrence of elements of both is essential to an understanding of most markets as they really are, in contrast with what they "ought" to be, in order to conform with assumed "ideal" conditions. Perhaps the concept is even more clearly stated if it is said that the typical market is compounded of elements of competition and monopoly.

and that results will be distinctly different depending on the way and the proportions in which the elements are combined. To vary the metaphor, markets are hybrids, not pure strains, and as hybrids they do not necessarily "tend to become" pure strains. The significant conclusion from this approach is that some mixture of competition and monopoly is a continuous and therefore normal, rather than a temporary, incidental, and abnormal, feature of most market situations.

The economic results as well as the market conditions of monopolistic competition, with respect to prices, qualities, entrance and withdrawal of firms, allocation of resources, profits, and output cannot be presumed to be the same as when competition is unadulterated. Without attempting to develop the analysis within the limits of this short treatment, it may be noted that conditions of monopolistic (impure and imperfect) competition are likely to be closely associated with persistent excess or underutilized capacity in an industry. ("The common result of this assemblage of factors is excess productive capacity, for which there is no automatic corrective. Such excess capacity may develop, of course, under pure competition, owing to miscalculation on the part of producers, or to sudden fluctuations in demand or cost conditions. But it is the peculiarity of monopolistic competition that it may develop over long periods with impunity, prices always covering costs, and may, in fact, become permanent and normal through a failure of price competition to function. The surplus capacity is never cast off, and the result is high prices and waste. The theory affords an explanation of such wastes in the economic system—wastes which are usually referred to as 'wastes of competition.' In fact, they could never occur under pure competition, and it is for this reason that the theory of pure competition is and must be silent about them, introducing them, if at all, as 'qualifications,' rather than as parts of the theory. They are wastes of monopoly—of the monopoly elements in monopolistic competition." (Chamberlin, *op. cit.*, p. 109.) Suffice to say that circumstances such as a limited number of sellers, differentiated services, large aggregates of capital as in the railroad industry, immobility of productive resources, including the enterprisers themselves, setting of prices in relation to costs, and regard for the possibility that actions taken (price reductions, for example), may bring reactions from rivals tend to send prices and costs above the equilibrium point of pure competition. If additional resources and sellers are attracted into the field as a consequence, the available business is divided among greater numbers, with perhaps no appreciable profits for the group as a whole. Sporadic price-cutting forays may be interspersed with controlled or even increased prices, by tacit agreement in the spirit of live-and-let-live. Minimum price or rate control, it may be noted, is likely to foster the same result with respect to increasing the number of sellers in the field; and that is one reason why the prescription of minimum rates requires implementation by control of entrance if the carriers are not to be chronically impecunious and their facilities underutilized. The conditions described are usually referred to as "wastes of competition," whereas they would not occur, except for brief periods, in a purely competitive market. They result instead from monopolistic elements in monopolistic competition.

PART I—SECTION VII
TRANSPORTATION AND PUBLIC PROMOTIONAL POLICY

By Wilfred Owen[1]

Introduction

Although the development of transportation in the United States has always been a primary interest of government, it is during the past two decades that public action in this field has achieved the most striking results. For these years have been the setting for revolutionary change, with government sponsorship of highway, water, and air facilities supplementing and supplanting railroad operations with a volume and variety of service never before available. Since 1920, more than 30 billion dollars of public funds have been spent on a vast network of improved highways over which 32 million motor vehicles now operate. The same period accounts for 2 of the 3 billions expended during the entire past century for river and harbor improvements, and for the rejuvenation of ocean shipping and of barge service on the inland waterways. In addition, recent public action has furnished impetus for spectacular innovations in air transport through the provision of nearly 30,000 miles of lighted airways, airport facilities, mail payments, and other aids.

This expanding role of government displays itself not only in physical plant but in the broadening aims of public expenditure. For during the past several years depressed economic conditions have introduced compensatory spending and work-relief objectives in the transportation program, accounting for billions of dollars spent on roads and streets, and hundreds of millions for airport and waterway projects. In addition, the more recent requirements of national defense have created vast new responsibilities and further pressing requirements for high standards of adequacy, including a shift of road-building emphasis to strategic highways and access roads, and a rapidly accelerating program of airport improvement and shipbuilding.

The current scope of activity in transport development emphasizes the importance of carefully examining public policy. For Government action, despite its obvious accomplishments, has by no means escaped criticism. Waste of public funds, vague and conflicting objectives, the absence of criteria to guide expenditure, and questionable methods of financing, cost allocation, and administration have all furnished evidence of serious shortcomings. Perhaps the most perplexing issues, however, concern the difficult status of the railroads in a public expenditure setting from which they are now excluded. Rail transport, privately operated and at present relatively unaided by Government, has yielded increasing volumes of business to the newer publicly-sponsored agencies, and this loss of traffic has led to charges of unequal treatment, unfair subsidy to competitors, uneconomic allocation of traffic, and unjustified financial distress. Highway and waterway interests, which have been the chief competitors of the railroads, have, on the other hand, denied railroad contentions of Government favoritism on the grounds that these public facilities are provided on a fundamentally different basis than are the railroads, and are subject to essentially different conditions of cost and use.

Other subjects of contention have developed from public promotional activity. Taxpayer groups have been critical of the size of the transportation bill, while various interests otherwise concerned with the amount of public expenditure or the adequacy of transport facilities complain that Government policy is overconservative. The relative merits of Federal, State, and local action are debated, as are also specific projects or programs such as the St. Lawrence Waterway, the extension of particular river improvements, and the construction of superhighways.

In view of the magnitude of transportation requirements and the challenge of current methods of attaining them, therefore, it is imperative that the issues be analyzed and implications of suggested future action fairly understood.

CURRENT PROMOTIONAL ACTIVITY

Federal

The provision of transportation facilities by the Federal Government involves the construction, maintenance, and operation of physical plant, the financing of facilities through loans and grants, and the furnishing of extensive auxiliary services. At the same time regulatory policy is directed in part toward preserving and fostering transport media by prescribing conditions to

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govern their use [2] By these methods the Federal Government has exerted far-reaching influence upon the American transportation system. Automobiles, busses, and trucks travel over Federal-aid highways constructed in part with Federal funds and maintained to Federal standards. Planes operating with the support of Federal mail payments are guided over Federal airways to airports improved as Federal relief projects. Ships at sea, financed by Federal loans, depend upon Federal navigation aids to lead them safely to harbors dredged and marked by the Federal Government. Altogether the average annual expenditure to make such transport development possible has for the past 10 years comprised an item of well over a billion dollars in the Federal budget.

State and Local

Despite the growing predominance of Federal activity in providing facilities for transportation, however, current efforts of the States and local governments are by no means insignificant. For many years the States have been preeminent in highway promotion, and the road and street programs of counties and cities are also conducted on a large scale. Altogether these government units account for approximately one and a half billion dollars of highway expenditure annually. In addition, municipal action is an important factor in airport improvements, and water transport is aided by State and local financing of docks and terminals, and by local participation in Federal waterway projects.

Highways

An estimate by the Public Roads Administration of Federal, State, and local highway expenditure places the annual outlay for roads and streets at more than two and a half billion dollars. Altogether, highway construction programs over the past 20 years have resulted in about 1,000,000 miles of new surfacing. The mileage of the several systems, their traffic, and the amount of money spent on them in a given year are contained in the accompanying table.

Approximately one billion of the two and a half billion dollars spent was derived from special motor vehicle taxes levied for highways, and another billion from Federal funds, the largest part of which were work-relief appropriations for local roads and streets. The remaining half billion dollars represented property levies, borrowings, and general-fund appropriations of State and local governments.

[2] The present chapter is concerned only with those promotional aspects of public action which involve the provision of facilities. For a discussion of regulatory policy see Part I, Sec. VI, 1, this report.

Highway Systems in the United States, 1938

System	Mileage		Traffic	Expenditures
	Total	Percent	Percent	Percent
Main rural roads and their transcity connection	352,000	11	57	33
Local rural roads	2,630,000	83	13	39
Local city streets	193,000	6	30	28
All systems	3,175,000	100	100	100

Source: Hearings, H. R. 7891, 76th Cong., 3d sess., p. 190.

State and Local Action

The State highway departments are directly responsible for over half a million miles of roads and streets, including the primary rural highways which carry the heaviest intercity traffic volumes, and a large mileage of secondary roads and main city streets which have been placed under State control. Counties and townships have jurisdiction over the remaining two and a half million miles, most of which are lightly traveled rural roads, with municipalities conducting most of the work on city streets. The importance of the State in highway promotion is indicated most strikingly in terms of finance, for State collection of motor vehicle fees and gasoline taxes has averaged over a billion dollars annually during the past decade. Nearly 60 percent of these user charges are now spent directly by the States, and more than 300 millions are made available by State governments to local highway units in the form of grants or shared taxes. In many cases, however, the States exercise little or no control over the ultimate use of funds distributed to local governments. The remaining motor vehicle tax revenue, amounting to almost 200 million dollars in 1940, is used for general purposes unrelated to highways. A summary of the trend in motor vehicle tax revenue and the manner in which it has been spent is presented in the following table:

Trend in Motor Vehicle Revenues and Their Distribution

[In millions of dollars]

Year	Total	For state-highway purposes		For local roads and streets		For nonhighway purposes	
		Amount	Percent	Amount	Percent	Amount	Percent
1927	560	410	73	123	22	9	1.5
1931	882	616	70	214	24	24	2.7
1936	1,057	583	55	265	25	169	16.0
1937	1,195	705	60	277	23	161	13.5
1938	1,175	686	59	280	24	158	13.5
1939	1,227	694	56	301	24	182	14.9
1940	1,321	754	57	323	24	197	14.9

NOTE.—The small percentage of funds not accounted for in this table includes administrative expenses and work on forest and park roads.
Source: Public Roads Administration, *Annual Tables*, series DF.

In addition to the function of the State in collecting, spending, and distributing highway-user revenue, State responsibility for constructing and maintaining the

State highway system involves the expenditure of Federal-aid funds and State taxes from non-motor-vehicle sources. In 1940, total disbursements by the State highway departments amounted to $1,013,000,000. Excluding debt retirement and transfers to local road units, actual current expenditures for State highways amounted to $812,000,000. This figure has averaged $850,000,000 a year over the past decade.

State Highway Disbursements 1939

Capital outlay	$523,000,000
Maintenance	215,000,000
Administration, engineering, etc	54,000,000
Interest on highway debt	66,000,000
Retirement of highway debt	128,000,000
State highway police	27,000,000
Total for highway purposes	1,013,000,000

Source: Public Roads Administration, *Annual Tables*, Series SF–2.

While the trend in State highway activities reveals more than a doubling of financial resources since 1927, there has been an opposite trend in local road finance. In 1930, local road disbursements totaled $852,000,000, and city streets expenditures accounted for several hundred million dollars more. During the past depression decade, however, the productivity of local property taxes fell to such degree that considerable assumption of local road responsibilities by the States became necessary, with the Federal Government adding to local road and street support through work-relief activities. These and other factors have been both cause and effect of a considerable reduction of the role and influence of local government in the financing of highways.

Federal Action

The most important development in the promotion of highway facilities during the past several years has been the increasing participation of the Federal Government. For, of a total Federal highway expenditure approximating 7 billion dollars during the past quarter of a century, over 6 billions have been made available since 1930. In each of the years 1936 and 1938, for example, Federal highway promotion involved a billion-dollar program, including the Federal-aid system, secondary roads, grade-crossing eliminations, road construction on public lands, and work relief. A summary of Federal action since 1933 indicates that work-relief projects have accounted for three-fifths of all funds spent since that date.

Recent Federal Expenditures for Highways, 1933–39

Year	Public Roads Administration	Agencies cooperating with Public Roads	Work relief agencies	PWA loans and grants	Total
1933	$199,000,000	$14,000,000	$145,000,000	$2,000,000	$360,000,000
1934	339,000,000	22,000,000	269,000,000	16,000,000	646,000,000
1935	232,000,000	14,000,000	227,000,000	37,000,000	512,000,000
1936	346,000,000	18,000,000	631,000,000	54,000,000	1,050,000,000
1937	285,000,000	17,000,000	448,000,000	14,000,000	788,000,000
1938	212,000,000	16,000,000	801,000,000	38,000,000	1,071,000,000
1939	191,000,000	16,000,000	670,000,000		877,000,000
Total	1,804,000,000	117,000,000	3,191,000,000	98,000,000	5,304,000,000

Source: Public Roads Administration, *Special Tabulation*.

Federal-aid program.—The Federal-aid highway system today comprises nearly a quarter of a million miles of the most important interstate and intercounty routes. This system, the designation of which was begun in 1922, was limited at first to 7 percent of the road mileage in each State. On it some two and a quarter billion dollars of Federal grants-in-aid have been spent since the beginning of Federal participation 25 years ago. Direction of this program is assigned to the Public Roads Administration, which acts through the several State highway departments cooperating with the Federal Government. Federal aid is divided among the States on the basis of population, area, and rural post road mileage. It is generally matched by an equal amount of State funds, its use is confined to construction, and its availability is contingent upon the existence of a responsible State highway department, and upon the maintenance of previous road projects to Federal standards. The States initiate, plan, and perform the work, but all projects require Federal approval. For the fiscal year 1941 this program was supported by an appropriation of $115,000,000.[3]

Extension of Federal aid.—Federal activity was confined to improvements on the primary system of rural Federal-aid roads until 1933, when as part of the emergency program to provide employment, Federal participation was broadened to include grants for extensions of the Federal-aid system through cities, and for secondary roads. Two years later, the first specific appropriation was made for railroad grade-crossing elimination. These revisions in Federal action have since become permanent policy, with Federal-aid authorizations for 1941 including an item of $30,000,000 for grade crossings and $15,000,000 for secondary feeder roads. Grade-crossing work is not confined to any system of roads, and although the States must provide right-of-way, there are no State matching requirements for construction. Secondly road aid, on the other hand, must be matched and spent on an eligible system of feeder routes comprising not more than 10 percent of rural road mileage. The purpose of these secondary highways is described as one of service "to

[3] For a complete account of Federal roadbuilding activity under the Public Roads Administration, see *The Public Roads Administration and Its Work*, P. R. A., 1939, 61 pp. mimeo.

the greatest number of farm homes and rural businesses" as distinguished from the regular Federal-aid objective of "traffic service to the population as a whole." [4]

Other Federal road construction.—Another class of Federal activity involves road construction in national forests, national parks, public lands, and Indian reservations. Since the forest program was initiated in 1917, nearly a quarter of a billion dollars has been spent for the improvement of a forest highway system designed primarily for the development and better use of resources. A smaller system of roads in national parks has been improved with Federal funds since 1924. All these appropriations are spent by Federal agencies cooperating with the Public Roads Administration.

Emergency expenditure.—In addition to these continuing Federal-aid programs, in recent years a substantial portion of Federal emergency spending has been applied to road-improvement work. From 1930 to 1935 an outright grant of $1,200,000,000 was made available to the Public Roads Administration for the purpose of stimulating business recovery. In addition, since 1935 the Work Projects Administration has spent $3,739,000,000 on highway projects to provide employment. By late 1941 this type of Federal highway work had involved some 600,000 miles, largely under county jurisdiction. Matching requirements were made flexible, with local units contributing an average of 25 to 30 percent of total cost: and in the selection of road location and design, emphasis was shifted from engineering and traffic considerations to the availability of unemployed labor and the possibility of high ratios of labor to other costs.

Foreign highways.—The Federal Government is also concerned with the promotion of foreign highway facilities to further cultural relations and defense activities. A 3,267-mile highway link between this country and the Panama Canal Zone is now more than half completed with all-weather surfacing, an accomplishment which has been furthered by United States cooperative action with the countries to the south. Effort on behalf of this Inter-American Highway was authorized by the Congress in 1928, and funds were appropriated in 1930 for a reconnaissance survey to establish the route. This work, undertaken by the Public Roads Administration at the request of the State Department, was carried out from 1930 through 1933. In the past 12 years, congressional authorizations of several millions have been made, and under cooperative agreements with several Central American Republics, materials, machinery, and technical direction have been provided. Financial arrangements have also been made through the Export-Import Bank of the United States, which has loaned $2,500,000 to Panama, $1,700,000 to Nicaragua, and $4,600,000 to Costa Rica. Recently the President requested an appropriation of $20,000,000 to be spent on the Inter-American Highway as a defense measure.

The Inter-American Highway, however, is but one link in the proposed Pan American Highway to extend from Alaska to the southernmost point of South America. Today three-fourths of the South American section between the Colombia-Panama border and Buenos Aires is passable during all seasons. To further this program the United States has assigned highway engineers to the South American countries requesting them, and has supplied information and estimates pertinent to the work.[5] Action in behalf of the North American section of this highway through western Canada to Alaska has not progressed beyond the stage of discussion and planning, but two commissions have been appointed by the Congress to cooperate with Canadian officials in the investigation of possible routes. National defense considerations are now promoting greater interest in a highway link between this country and Alaska.

Summary of Federal Action

A summary of Federal highway authorizations supervised by the Public Roads Administration since the beginning of the Federal-aid program in 1917, through the fiscal year 1941, establishes the total participation at $3,694,000,000. With the addition of $3,739,000,000 spent for work-relief projects on roads and streets from April 1935 to January 1, 1941, Federal highway expenditure since 1917 reaches a grand total of $7,433,000,000.

Summary of Federal Highway Promotion

Supervised by Public Roads Administration:	
Regular Federal aid, 1917–41	$2,235,000,000
Forest roads, 1917–41	236,000,000
Public land roads, 1931–41	23,000,000
Emergency funds, 1930–35	1,200,000,000
Total, 1917–41	3,694,000,000
Works Projects Administration, 1935–40	3,739,000,000
Grand total,[1] 1917–41	7,433,000,00

[1] Including P. R. A. authorizations to June 30, 1941, and W. P. A. expenditures to January 1, 1941.

Problems

Description of the role of public action in the provision of highway facilities reveals that road building

[4] Statement of T. H. MacDonald, Commissioner, Public Roads Administration, *Hearings*, H. R. 7891, pp. 213 and 221.

[5] The Export-Import Bank has loaned $2,500,000 to Paraguay and $900,000 to Ecuador.

has accounted for a very large percentage of total public funds spent for transportation. Highway policies, therefore, require particular scrutiny as to their effectiveness in providing satisfactory facilities, and the revisions which might lead to greater achievement. The phenomenal growth of Federal influence has raised extensive new issues concerning the relative merits of centralized and local administration, inter-governmental relations, work relief, and the actual accomplishments of such enormous expenditure. Later sections will attempt to review some of these problems.

Air Facilities

Federal Action

The newest Federal activity in transport promotion, and one which may well cause the greatest repercussions throughout the transportation system, is the encouragement of air transport development. This is being accomplished by the provision of airways and airports, financial assistance to carriers through air-mail payments, the training of pilots, the development of new techniques, and various economic and safety regulations designed to develop a healthy condition within the industry. Congressional declaration of policy has made clear the intention to achieve by these methods an air transportation system "properly adapted to the present and future needs of the foreign and domestic commerce of the United States, of the Postal Service, and of the national defense." The tremendous expansion of flying facilities and air traffic in the past several years indicates the success which has attended this effort.

Airways.—The Federal airway system, constructed, maintained, and operated by the Federal Government through the Civil Aeronautics Administration, comprises a network of approximately 30,000 miles of lighted routes in the continental United States. From 1935 through the fiscal year 1941, airway expenditure has totaled approximately $125,000,000, with annual outlay expected to reach $26,000,000 in 1941. Airway facilities consist principally of beacons, teletype circuits for weather reporting and traffic control, radio range and communication stations, and lighted intermediate landing fields.

Federal Airway Expenditures 1940

28,745 miles of lighted airways	$14,060,563
320 intermediate landing fields	1,666,206
Radio and communication	4,872,214
Weather and traffic teletype circuits	1,228,118
Total airway expenditures	21,827,101

Source: Civil Aeronautics Authority, Second Annual Report, 1940, appendix F pp. 35, 36.

Airports.—Unlike the provision of airway facilities, airport development has been a product of the combined efforts of several levels of Government, as well as of private interests. Total airport expenditure in the United States up to 1939 was over $325,000,000. As of 1933, this expenditure was equally divided between municipalities and private or commercial sources, with negligible State and Federal participation. Since that time, however, the Federal Government has provided the most important impetus to airport construction through work-relief programs, which accounted for an outlay of $169,000,000 from April 1935 to January 1941. A summary of capital expenditures to January 1, 1939, illustrates the rapid development of Federal action in this field.

Airport Capital Expenditures

[As of Jan. 1, 1939]

Source of funds	Expenditures prior to 1933	Percent	Expenditures 1933-38	Percent	Total to Jan. 1, 1939	Percent
Federal	$1,094,328	0.7	$137,931,950	76.7	$139,026,278	42.6
State	2,905,869	2.0	3,643,188	2.0	6,549,057	2.0
Municipal	69,664,517	47.6	31,794,715	17.7	101,459,232	31.1
Private or commercial	72,646,799	49.7	6,561,745	3.6	79,208,544	24.3
Total	146,311,513	100.0	179,931,598	100.0	326,243,111	100.0

Source: Civil Aeronautics Authority, *Airport Survey*, H. Doc. 245, 76th Cong., 1st sess., p. 13.

Federal airport programs in the first 6 years after 1933 involved an outlay of $139,000,000, compared with but $1,000,000 prior to 1933. State expenditures, on the other hand, have never amounted to more than 2 percent of the total, and while municipalities had spent $100,000,000 by 1939, airport work done entirely at municipal expense has been rare since 1933. The notable shift from commercial to public operation of airports has been encouraged by the stipulation that Federal relief funds may be used on public airports only. The result of airport investment from all these sources has been an increase in the number of civil airports from 823 at the end of 1927 to 1,907 by January 1, 1939.

Airports in 1939

Type	*Number*
Municipal	1,046
Commercial or private	787
State	48
Federal (civil)	26
Total civil airports	1,907
Civil Aeronautics intermediate fields	267
Total civil landing areas	2,174

Source: Civil Aeronautics Authority, *Second Annual Report*, appendix R, p. 54.

Other aids.—In addition to the provision of airways and of financial assistance for airport construc-

tion, the Federal Government has encouraged air transport by several other means. Government compensation to air carriers for transporting mail on domestic routes averages five times the equivalent passenger rate, and these payments in 1940 totaled $18,536,000, or 29 percent of all domestic air-line revenue. Certificates of convenience and necessity have been an important instrument for directing a sound development of facilities, and the certification of airmen and aircraft, as well as safety rules and inspections, have played an important part in the 17 months' perfect safety record enjoyed by the air lines up to August 1940. Finally, the Civilian Pilot Training program of the Civil Aeronautics Administration, begun in 1939, has been an important adjunct to the development of nonscheduled flying. It is expected that during 1941 some 48,000 pilots will complete their training, which is more than the total number of pilots trained during all the previous history of American aviation.

Foreign airways.—The promotion of foreign air routes has become a very considerable interest of the Federal Government. In 1940, foreign air-mail compensation was being awarded at a rate which was approximately 4.5 to 5 times higher than on domestic routes, and in 1939 such compensation amounted to over $10,000,000, or more than half of total revenues realized on foreign schedules. In addition to this financial assistance, which has assured foreign carriers a profit every year since 1931, Federal policy has included the provision that no carrier may operate on foreign or overseas routes without a certificate of convenience and necessity from the Civil Aeronautics Board. There are now 180 United States planes operating on 46,000 miles of foreign routes spanning the Atlantic and Pacific and linking five continents.

Problems

Review of the expanding activities of Government in air transport promotion suggests many new problems. The airplane, because of its comparatively recent development and high degree of importance for defense, commands at this time the special protection and encouragement of Government. This policy, however, promises to create important repercussions in the transport field, and the expansion of plane production sponsored by the defense program indicates the necessity of planning adequate absorption of such capacity after the war. The provision and financing of airport and airway facilities in the future, the division of costs and administrative controls among governmental units, and the problems arising from the impact of the new industry upon established transport media constitute challenging tasks for public action.

Water Transport

The fostering of transportation by water is a traditional interest of the Federal Government, which has been the chief source of expenditure in this field during the past century. Federal promotion has resulted in the availability to American shipping of harbors and channels on the oceans and Great Lakes, an extensive inland waterway system, and the provision of numerous aids to navigation. In addition there are special types of Federal action, including promotion of barge service through the Government-owned Inland Waterways Corporation, and the development of an adequate merchant marine through shipbuilding programs, financial assistance to carriers, training of seamen, ocean mail payments, and miscellaneous promotional activities.

Federal Action

Rivers and harbors.—The Federal Government has thus far spent more than two and a half billion dollars for river and harbor improvements, of which approximately one-half has been spent during the past decade. This sum has been used for the improvement, maintenance, and operation of harbors on the seacoasts and Great Lakes, and for the development of the Mississippi River system, the intracostal canals, and other waterways. There are now 844 active river and harbor projects operated by the Federal Government, although current expenditure for many of these is negligible, and many of the projects serve other purposes as well as transportation. Some 28,000 miles of inland waterways exclusive of the deep water routes on the Great Lakes have been improved to varying extent as Federal projects; but most of the expenditure and most of the tonnage are confined to a 6,000-mile standard interconnected system having dimensions adequate for modern towboat and barge service. It is this network, comprising the Mississippi and Warrior River systems and the connecting Gulf-Intracoastal Waterway, which is the competitive segment most seriously affecting other transport media.

Federal Expenditure on River and Harbor Projects

[To June 30, 1940]

Location	Cost of new work		Maintenance	
	Amount	Percent	Amount	Percent
Seacoast harbors and channels	$666, 531, 509. 04	35. 2	$271, 237, 245. 11	38. 4
Intercoastal canals and other waterways	146, 843, 157. 62	7. 8	64, 300, 991. 83	9. 1
Mississippi River system	813, 589, 175. 64	43. 0	241, 707, 849. 73	34. 2
Lake harbors and channels	204, 641, 490. 38	10. 8	73, 189, 383. 41	10. 4
Miscellaneous	60, 609, 490. 39	3. 2	55, 685, 435. 70	7. 9
Total	1, 892, 214, 823. 07	100. 0	706, 120, 905. 78	100. 0

Source: *Annual Report of the Chief of Engineers, U. S. Army, 1940*, p. 20.

Responsibility for river and harbor improvements is vested in the Secretary of War, and work is carried on under the direction of the Chief of Engineers of the United States Army. Investigations of contemplated projects are initiated by Congress, usually at the request of commercial, industrial, or navigation interests in the area, and economic justification is determined by the Corps of Engineers. Final acceptance by Congress permits a project to be placed on an approved list, and a lump sum appropriation is spent upon the new projects listed, and upon maintenance and construction of old projects, according to priorities left to the discretion of the Chief of Engineers.

Revival of inland waterway development by the Federal Government during the past 2 decades was initiated largely because of need for additional transportation facilities resulting from the strain on railroad capacity during the last war. In addition, the belief has been expressed that water transport is inherently cheaper than other forms, that it can provide more satisfactory transportation for low-grade bulk commodities, and that it acts to hold down railroad rates. Other facilities have been a byproduct of recent irrigation, flood control, and power projects.

Inland Waterways Corporation.—Special promotion of water transportation by the Federal Government has been established through the Inland Waterways Corporation of the Department of Commerce, which operates 277 barges along approximately 3,000 miles of waterways. This activity is intended as a demonstration to private operators of the economic feasibility of barge service.

Merchant Marine.—Another special type of Federal action in the field of water transportation is the development of coastal, intercoastal, and foreign shipping by the construction of vessels, the granting of construction and operating subsidies, the training of personnel, and other work involving the welfare of the American Merchant Marine. This activity is carried on by the United States Maritime Commission, established in 1936. Up to June 1940, the Commission had spent a quarter of a billion dollars for its merchant marine program, and since 1938 it has let contracts for 198 vessels, of which 101 have been launched and 70 delivered. By the end of 1941 this emergency program will be producing 1 ship every 5 days. Further Commission activity in connection with the task of maintaining "the vital bridge across the ocean" involves a more recent shipbuilding effort to provide ships in connection with defense and lend-lease operations. This objective has called for one appropriation of $350,000,000 for 200 freighters and another sum of $629,000,000 made available through the Lend-Lease Act for an additional 400 ocean-going vessels.

Auxiliary aids.—Lighthouses, light ships, and other aids to navigation are established and maintained by the Coast Guard. The yearly cost of this service averages about $12,000,000.

Panama Canal.—The Panama Canal is operated by a Government Corporation as a public-service enterprise, and financing is achieved by the imposition of tolls. In 1940 expenditures on the Canal totaled $14,807,000 and income $26,000,000. A fixed capital charge of $14,435,000, however, created an accounting deficit of $3,181,000.

State and Local Action

Except for the New York State Barge Canal and the Chicago Ship Canal, no large sums are being contributed by non-Federal jurisdictions for the development of waterways. Up to 1931, however, it is estimated by the Corps of Engineers that State expenditures had exceeded half a billion dollars. Municipalities have also been active in providing terminal facilities and other port developments, and suitable terminals must now be provided locally before barge service is extended by the Inland Waterways Corporation. Further local participation has been stimulated recently by the provision that the Chief of Engineers must include a survey of local benefits in all waterway project reports as a basis for determining local cost contributions. In 1939, river and harbor projects requiring such local participation numbered 129, and the sum involved totaled 24 million dollars.

Problems

Most of the issues of transport policy involving water transportation have concerned the inland waterways. The contention that water transport is necessarily cheaper than other forms has been denied in view of the wide variations in total costs of water transportation. For example, the inclusive cost of transportation on a waterway navigable by nature is quite different from the cost involved when extensive sums have been necessary to render navigation possible. Moreover, the claim that waterway improvements are justified on the basis of needed additions to transport capacity or for the regulation of railroad rates has been questioned on the grounds that there no longer exists either a general undersupply of transport facilities or a deficiency of other controls. The question of economic justification of waterway projects and the possibility of collecting user charges will therefore require later examination.

Summary

Development of transportation by road, water, and air has become a tremendous activity of government. Public expenditure for this purpose now aggregates nearly 3 billion dollars a year. But examination of present policies raises issues as to the soundness of established methods and aims, and the possibility of achieving through them a satisfactory over-all transportation system in conformity with national objectives. For today many of the factors present when promotional methods were first introduced no longer apply. Monopolistic control by the railroads has been supplanted to a large extent by intensive competition between rail service and newly developed public facilities; and a shortage of transportation service has yielded to circumstances in which facilities are on the whole more highly developed, yet often improperly located and designed, oversupplied in one place and undersupplied in another, inefficiently operated, or lacking coordination.

The following sections will attempt to examine some of the alternatives to current public action and the implications involved, in order that suggestions may be offered which might advance the realization of better transportation service at lower cost.

FINANCING PUBLIC FACILITIES

At the present time general taxation provides the funds for air and water facilities, and to a considerable extent for highways. The question raised is whether in this manner it is desirable to include transportation facilities in the same category with general governmental services such as education and defense; or whether transportation should rather be looked upon as similar to the supplying of food and clothing, of which it is a part, and therefore financed by the user.

A choice between general taxation and user charges to finance public transportation facilities involves several considerations. First is the objective of obtaining the necessary funds, and of doing so on a sound basis. Second, since the productive resources absorbed are extensive, the method of finance should encourage their careful and economical employment. Again, since public facilities will assist private transport undertakings, but assist them unequally, it is desirable to finance in such a way as to offset any unfair competitive advantages which might lead to an uneconomic division of traffic among agencies, and incidentally aggravate the already serious railroad problem.

Advantages of User Charges

From many standpoints it seems desirable to depend chiefly upon user charges to finance transportation facilities. Negatively, there is no general reason why it should not be done this way, since transportation is an integral part of our entire economy, and should be subject to the principles through which economic organization is controlled. Positively, user charges, where they can be conveniently imposed, are in the first place a useful financial expedient in lieu of general taxes. The phenomenal productivity of the gasoline tax and registration fee for highway purposes is an outstanding example. These levies, reflecting in rough approximation the use of highway facilities by motor vehicles, have to a considerable extent supplanted general fund appropriations and road taxes on property: and they have supplied revenues in large amounts on a stable and predictable basis. This has made possible a continuing highway program and provided a basis for financial planning, both of which are important to the preservation of the highway investment in view of the absence of reserve highway funds and dependence chiefly upon pay-as-you-go finance.

As a further advantage, user charges impose a broad restraint upon extravagance, since beneficiaries know they must foot the bill. The resulting caution is an important aid to a proper utilization of resources because it introduces the underlying concepts of balancing costs and benefits to achieve the best results from the lowest possible outlay. The demand for transportation service, expressed in the revenues or "earning power" of various facilities, is also a valuable guide to a proper programming of expenditures. In short, removal of these problems from the realm of general fund appropriations encourages the use of economic criteria and discounts political considerations, with the result that greater emphasis can be placed upon the selection of economic projects.

Still another advantage of user charges is the fact that they establish a sounder basis for competitive relationship among facilities because they enter into transportation costs and charges. Thus, the fact that trucks pay large sums for the provision of highway facilities is reflected in the rates charged for hauling commodities, and this tends to permit a more rational selection of alternative transportation methods on a cost basis. The presence of large overhead items and the resulting opportunity for rate experimentation prevent any precise cost comparisons; but the absence of user charges, as on toll-free waterways, may mean that the allocation of traffic between waterways and other fa-

cilities is a function of the subsidy rather than any considerations of true economy.

Does it follow, in view of these advantages of financing through user charges, that all the cost of publicly provided facilities should be imposed upon the user? The mere presence of collateral benefits of a general nature seems to offer no reason for a negative answer. Many private industries yield important general benefits, but are still supported by the users of their product. However, if the general benefits are a primary objective in providing the facilities, and they call for a provision of facilities in excess of what would otherwise be justified, a reason for general-fund contributions is indicated. Among the objectives which might overrule the self-liquidating principle are specific national defense projects, such as the construction of tactical roads for army maneuvers; or business and employment stabilization programs, to the extent that they exceed in cost or scope the normal provision of transport facilities. Grants of subsidy to insure the growth of newly developed industries are a further example, as well as the development and conservation of resources.

Allocation of Resources

While financing through user charges should promote a more economic use of public funds, it should be noted that this method does not provide an automatic guide by which the justification of investment can be determined. For although private outlays are deemed to be worth making if the result has a value sufficient to cover the cost, it cannot be said that public outlays are justified if costs are covered by user charges, since the user charge as a guide to investment has two defects.

1. User charges are not competitively determined, but established by legislative decision. No one would argue that the amount a monopoly can exact under conditions of inelastic demand automatically determines justifiable investment.[6] And in the case of transport facilities, not only is demand inelastic because of the generally essential nature of transportation, but the charge for using public facilities would in most cases be so small a part of total costs that it would possess "the importance of being unimportant." For example, the demand for highway transportation service has in the past been generally unresponsive to rising gasoline tax rates because these taxes are small compared with other vehicle operating costs; and because better vehicles, better roads, and declining gasoline prices have lessened the impact of higher taxes. The same condition can no doubt be expected in future air transport development.

2. User charges are not levied on the basis of particular projects and do not reflect what users would be willing to pay in specific investment situations. This difficulty can be met where the toll principle applies, except that in such cases investment decision must rest on the basis of estimated tolls. For this reason, regardless of public financing methods, engineers must continue to make their careful estimates of the probable value and cost of particular projects. Thus, highway engineers have developed techniques for estimating traffic volumes and have conducted studies of highway and vehicle operating costs. Likewise, the Army Engineers have introduced measurements of costs and benefits to aid in determining economic justification. These methods, to the extent that they have been effective in removing investment decisions from the political arena, are to be commended.

The Problem of Equalizing Competition

Another question involving user charges is the matter of whether reliance upon them will equalize competitive opportunities among transport agencies, promote an economic assignment of traffic, and prevent the position of the railroads from being worse than is inherent in the present situation. Under existing conditions it is apparent that inequalities result from the fact that air, water, and highway facilities are financed in varying degree through general funds, while railroads at present receive no direct support from general taxation. Because of this contrast in methods of finance, railroads compete at a disadvantage in the transport market, and the claim has been made that much of the traffic lost to agencies using publicly provided facilities would never have left the rails had these agencies been required to pay their way. It is true that railroad development received public support at an earlier period through public land grants, tax concessions, and other aids, for public policy has generally sought to assist important new industries which would otherwise be retarded; but these past aids are of little consequence in an intelligent solution of the present problem. The small degree of recent public efforts on behalf of the railroads may likewise be disregarded, for savings which have accrued through reduced interest and other charges in connection with Federal loans are minute in comparison with public outlays on other transport facilities.

Under these conditions the impact of new competitive agencies upon the railroads has grown to considerable proportions. For while population and industrial activity have been increasing, railroad

[6] The belief that resource allocation is automatically guided by placing highways on a self-liquidating basis has been denied by one writer as follows: "The defect is elementary. Any monopoly of a necessity may readily exact from its customers a gross return far greater than may reasonably be committed to conducting and expanding the enterprise." Shorey Peterson, Highway Policy on a Commercial Basis, *Quarterly Journal of Economics*, May 1932, p. 435, vol. 46.

traffic volume has not only failed to respond favorably, but has actually declined. Following the 1923 peak of 38 billion revenue passenger-miles carried by class I railroads, traffic decreased to 23 billion in 1939, and tons of revenue freight originated fell from 1,279,000,000 to 902,000,000 over the same period. In contrast, transportation by waterway and air has shown impressive gains, and the development of motor transport by highway has been phenomenal. In 1939, trucks were estimated to be carrying 8.5 percent of all intercity ton-miles of freight, and inland waterways nearly 18 percent, most of this being on the Great Lakes.[7] As for passenger traffic, 91 percent of intercity travel was other than by rail, and highways accounted for the largest part. Excluding the private passenger car, which carried 85 percent of all intercity passenger-miles, total commercial operations were 35 percent by bus, 6 percent by air and water, and 59 percent by rail.[8]

It cannot be assumed, of course, that today's total traffic would be moving by rail in the absence of alternative media, for the preponderance of induced traffic resulting from the development of new transportation methods is unmistakable. Cost and service advantages made available by the private passenger car and truck, for example, have introduced a new mobility based upon the convenience of frequent short-run operations and the cheapness of more intensive vehicle use. Travel by air, too, represents not only competitive traffic taken from rail patronage of parlor and sleeping cars, but in large part new business developed as a result of speed and service factors.

Regardless of how much of the traffic moving by air and highway is newly created, however, sufficient volumes of passenger and freight business have been taken from the rails, or kept from them, to result in serious financial consequences for rail operation. And it is not merely the traffic lost, but also the necessary lowering of rates to retain traffic, which has spelled diminishing revenues. Furthermore, in the case of air and water transportation, the fact that carriers pay little or nothing for these facilities establishes the conclusion that railroads have been the victims of subsidized competition to the extent that traffic moving by air and water would have moved by rail save for lower rates made possible through appropriations from general funds. As for motor transport, which contributes large sums of user revenue for financing highways, it is believed that the multiple nature of the highway function and the predominance of overhead costs combine to make it more a matter of conjecture whether vehicles as a class, or specific types of vehicles, pay a proper share of the highway bill in a particular State.

That charging the user for public facilities should tend to reduce these inequalities among transport media, and thereby permit a more economic assignment of traffic, seems fairly apparent. Whether inequalities would be eliminated by user charges, however, is difficult to say. For self-liquidation as generally designated in public undertakings does not rest on the same basis as the financing of private enterprise. Thus, when the users of public facilities pay their way, they contribute in user taxes or tolls an amount equal to the annual expenditure, including maintenance, replacements, and improvements. On the other hand, self-liquidation in commercial finance involves the raising of revenue sufficient to cover not the actual expenditure for any given year, but rather the annual economic cost, including maintenance, a computed depreciation charge, and interest on unamortized investment. The chief difference, then, is the fact that ordinary public financing, which is the budgetary approach of providing the total spent in any given year, takes no account of implicit costs corresponding to the rate of return from private investment; while on the other hand, under such budgetary financing, user charges may be designed to cover large capital outlays and not merely current costs.

In view of these differences between public and private finance, is it desirable, in order to bring about the nicest possible adjustment in the competitive situation, that the cost of public facilities be defined in the same manner as that of the railroads? The proposal to extend the "public utility" concept to public agencies, which has created particular discussion with reference to highways, is evidence of the belief in such a remedy. According to leading proponents of this idea, it is necessary for Government "to look upon the highway system as a public utility enterprise" because "the motor vehicle has become a strong competitor of other forms of transport which are managed and financed as public utilities."[9] This conviction has even found judicial support in a lower Federal court, which in referring to the highway system as a public utility has stated that "the annual cost of operating such utility should be determined in the same manner as for a privately owned utility."[10]

A number of disadvantages are revealed in the financial revision here proposed. Among these is the necessity of computing valuation and depreciation to

[7] Not only public facilities, but private pipe lines as well, were prominent in intercity service. These accounted for 12 percent of ton-mile movement.

[8] Interstate Commerce Commission, *54th Annual Report, 1940*, p. 23.

[9] Breed, Older, and Downs, *Highway Costs*, Association of American Railroads, 1939, pp. 2–3.

[10] *Brashear Freight Lines, Inc., vs. Hughes*, 26 F. Supp. 908 (1938).

establish a rate base for the highway system, a process which for the railroads has meant more than 2 decades of costly effort, with little compensating advantage. In addition, the raising of capital for highway investment through taxation has eliminated the necessity of interest payments; and although indebtedness in many cases has been incurred, and interest charges therefore included in the highway bill, pay-as-you-go finance is the general practice and its results on the whole have been salutary. At least, to alter this method to conform with the railroad financial pattern seems to offer no inviting alternative.

Reference to the exclusion of interest on invested tax funds from highway financing, it should be explained, applies only to the problem of financing, of determining the levies to be imposed on traffic; it does not concern the problem of investment, of determining the amount of capital that can economically be devoted to highway purposes. Resources so used should promise as great a productivity as if they were employed elsewhere. Along with other costs there should be set against the anticipated benefits a rate of return such as could be expected, with allowance for differences in risk, from the available alternative uses of the resources required for any highway development. But decisions as to what outlays are justifiable must necessarily be made separately from decisions respecting finance; and they involve their own formidable difficulties, both in determining benefits and costs.

Attempts to arrive at an annual cost figure for highways, upon which to base a tax schedule for motor vehicles, have revealed the wide margin for judgment in estimating investment costs and rates of depreciation. The report of the Association of American Railroads set the total annual cost of all highways in the United States for the period 1921 through 1937 at $31,120,214,000.[11] The Federal Coordinator arrived at a comparable figure of $25,519,089,000, or $5,601,125,000 less. Other reasonable assumptions as to pavement lives, salvage values, and past investments would inevitably lead to still different figures. The main criticism with the annual cost basis, however, is its emphasis upon cost incurred in the past, and its lack of concern over the real problems of providing funds to finance requirements in the future. This emphasis can hardly be avoided in view of the fact that valuation, depreciation, and interest computations apply to the problem of setting rates to assure a "fair return" on a "fair value," an objective which is generally inapplicable in financing public transportation facilities.

Granting that the public stands to lose if an uneconomic allocation of traffic increases the total transportation bill without compensating gains, adoption of the public utility concept is a difficult and doubtful remedy. In fact there appears to be no convincing reason why public finance should be altered to conform with railroad finance instead of the reverse; and there is even no indication that the extension of public utility finance would create a situation very different from that under self-liquidation in the budgetary sense, for differences in supplying capital under the two methods might balance well enough for all practical purposes. If this were not the case, there appears to be no reason why user charges would necessarily be higher on a public utility cost basis rather than a budgetary basis, since new capital now being provided in large amounts through current taxes would henceforth be provided over longer periods through borrowing.

Continuation of private railroad operation and adoption of user charges to cover the budgetary requirements of public facilities, however, would not necessarily provide an economic organization of the transport industry even under the most favorable circumstances. For aside from the many revisions which would still be necessary to achieve a more economic railroad system, a further obstacle to creating an equal competitive situation would be the possibility of exceptions to the self-liquidating principle for public facilities when general governmental objectives and the transportation objective failed to coincide. For example, a public works program undertaken to provide employment might result in highway improvements of sufficient magnitude to shift competitive traffic from the rails.

In view of the logic that government should be free to use the highways as a means of utilizing idle resources during depression, one solution which has been advanced for equalizing competitive opportunities would place the railroad rights-of-way under public ownership in the same manner that highways, airways, and waterways are now provided, with the financing of these facilities accomplished through user charges collected from private rail carriers operating over the public ways. Exceptions to the self-liquidating principle would then apply to any or all agencies, and public action could be directed in accordance with a master plan for transportation as a whole. This proposal, it is true, introduces formidable problems in finance and operation; yet a failure by other methods to eliminate the competitive effects resulting under present conditions may make such a measure not only desirable but inevitable.[12]

[11] Breed, Older, and Downs, *op. cit.*, pp. v and 104.

[12] For a discussion of the pros and cons of various types of public ownership of railroads, see Part I, Sec. VIII, this report.

Determining User Charges

A final problem in the financing of public facilities is a determination of how each user or class of user should contribute to the total annual expenditures considered economically justified in the provision of transportation service. This involves both allocating costs and establishing methods of collection. The most important issue in this connection, and perhaps the most difficult, is the division of highway costs among motor vehicles. At the present time motor vehicle registration fees and other vehicle levies constitute a perplexing array of charges generally lacking any connection with highway costs. These fees, together with gasoline taxes, are the means of collecting highway user revenues. Although the desirability of equalizing competitive opportunities through user charges would seem to require that such levies reflect as accurately as possible the costs incurred for particular segments of traffic, at least in the case of highways the attempt to arrive at a generally acceptable cost allocation has repeatedly failed. For the fact is that a large part of the highway plant is provided to serve all vehicles jointly, and no specific cost can be attributed to any particular unit of traffic in its reasonable use of those facilities. If all vehicles were identical in size, weight, and equipment, if they traveled the same annual mileage at the same speed, and if all highways which they used were of the same type, responsibility for highway expenditures could be divided among vehicles equally. The fact is, however, that vehicles are of widely differing weights and dimensions, and weights and dimensions which are constantly changing. They have different equipment, travel different mileages and speeds, and on different parts of the highway system; and this system itself comprises a diversity of pavement types, designs, and costs.

Yet even if it were possible to find some adequate measure of the quantity and type of use actually made of the highways by various classes of motor vehicles, it would still be impossible to assign responsibility for highway expenditures on any precise basis; for it is not known to what extent traffic volumes, traffic loads, or natural factors govern pavement depth, or to what degree the widths of vehicles, their driving characteristics, their speed, or their numbers influence the selection of pavement widths. No less indeterminate are the factors influencing costs due to alinement, grading, and maintenance. In short, most highway costs represent overhead, and the problem of determining what share the various classes of motor vehicles ought to pay, let alone of determining what individual vehicles should pay, is a matter not susceptible to analysis on a cost responsibility basis.

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Under these conditions the determination of a motor-vehicle tax schedule has become essentially a budgetary problem of raising in the most equitable manner, and in keeping with desirable public objectives, the total amount which it has been determined could be economically justified for roads in any given year.[13] Preservation of the road system, and matters pertaining to such factors as safety and convenience, would be the concern of regulatory rather than tax policy.

Feasibility of User Charges

In view of the conclusion that public facilities should be provided on a budgetary basis, and, with certain exceptions, financed through the imposition of user charges, examination will be made of the varying characteristics of air, water, and highway facilities to explore the possibilities of this proposal.

Airways and Airports

Current promotion of air transport by the provision of airways and airports, and by air-mail payments and other aids, has been predicated on objectives similar to those underlying early railroad aids and tariff protection for new industries, with the added fact that in this case the innovation is of peculiar significance for defense. Air transport subsidies, however, while recognized to be of unquestionable public interest, are today assisting in the creation of competition with truck and rail which will soon reach substantial proportions. It has been estimated, for example, that within the next decade or two, under favorable circumstances, commodity traffic by plane will increase 185 times from the present volume of 3,000,000 ton-miles to 550,000,000 ton-miles. Air-mail business is expected to be 7 times greater than today, and an anticipated travel of 6 billion revenue passenger-miles will be the equivalent of 70 percent of present-day Pullman travel.[14]

While the current rate of development in air transportation would be impossible without Government aid, in view of the growing strength of the industry, there will undoubtedly be diminishing justification and need for subsidy in the future. Already encouraging indications of eventual self-support have appeared in lowered costs and increasing revenue traffic. Cost of transport plane operation fell from 49 cents per pay-load capacity ton-mile in 1935 to 35 cents in 1940, and domestic passenger rates dropped from 12 cents per mile in 1926 to an average of between 4 and

[13] To which might be added such general tax contributions as the State may care to exact. For a summary of the various factors entering into a determination of vehicle tax rates, see "Motor-Vehicle Taxation Rate Making" by Lacey V. Murrow and Bertram H. Lindman, *Civil Engineering*, November 1938, pp. 735–738.

[14] See Part II, Section 1, this report.

6 cents in 1939. Total revenues realized by domestic carriers rose from $23,000,000 in 1935 to $65,000,000 in 1940, with the result that an operating deficit of $3,300,000 for the industry in 1935 yielded to an operating profit of $6,150,000 in 1940. Government rates of compensation for domestice mail carriage, too, have decreased some 50 percent in the past 10 years to an average of 1.2 mills per pound-mile, and the Civil Aeronautics Authority recently declared that it was making "a constant effort to increase commercial revenues, thereby resulting in the attainment of an increasing measure of commercial self-sufficiency." [15]

A beginning trend toward self-liquidation is noted in the provision of airports. A special study of the nine United States airports having the largest volume of transport operations in 1937 showed average operating and maintenance costs of $120,000 per airport, and an average income of approximately $70,000. Two of the nine showed operating profits. Income was derived from landing fees, hangar storage, the sale of gas and oil, concessions, and a number of other sources. Only two ports charged landing fees for other than commercial carriers, and many cities made no attempt to make their airports pay for themselves, preferring to recognize indirect community benefits by imposing only nominal direct charges.[16] Future efforts to provide revenue from airport operations, however, hold considerable promise, as does also the use of gasoline taxes collected from the sale of aviation gasoline. Eight States now use all and three use part of the proceeds of gasoline taxes for air transport development. Most of this money is spent for airport improvement, and either allocated among all the airports of the State or spent at the port where collected.

In addition to the 11 States now making such use of gasoline taxes, nine others levy special user taxes on aviation gasoline but fail to designate the use of these funds for flying facilities, a practice which requires revision. It is also believed that the imposition of gasoline taxes to finance airport development might well be extended to the remaining 28 States which at present grant tax exemptions or refunds. The future revenue possibilities of this tax are apparent from the fact that the consumption of gasoline by domestic, commercial, and private planes now exceeds 50 million gallons, which at the average State gasoline tax of 4½ cents per gallon would produce 2½ million dollars. The demonstrated success of the gasoline tax in highway development and the rapidly increasing aircraft consumption of gasoline suggest that a similar plan would be highly desirable for eventually financing an integrated airway and airport system.

In conclusion, it is accepted that general fund contributions for air facilities are at present necessary to induce sufficient traffic volume to make possible eventual self-support at low unit cost and to serve the immediate interest of the Federal Government in air development for defense. At the same time, however, the best interests of the air industry, in terms of financial stability and dependable planning, will undoubtedly be furthered by the gradual adoption of user charges to furnish a continuing and predictable source of revenue. In addition, such a financial plan will further the possibilities of an economic organization of transportation as a whole.

Waterways

Inland waterways, like air facilities, are at present financed through general taxation. The important distinction should be noted, however, that neither the furthering of innovation nor unusual defense significance is a factor in the subsidy. It has, therefore, been suggested that tolls be collected from users, not only because such user charges would tend to overcome the inequalities in rail-water competition, but because the lack of any relation between the cost of waterway facilities and the raising of revenue to defray these costs has resulted in numerous uneconomic projects. For example, on the Mississippi River System up to 1936, 65.5 percent of the mileage had absorbed 31 percent of total expenditures and accounted for but 2 percent of ton-mile use. According to a report of the Federal Coordinator, in some cases it would require more traffic than moves by all agencies of transport within the area to bring waterway use up to effective working capacity. It is concluded in this report that "more commonly than otherwise, waterways represent an uneconomical form of transportation." [17]

Imposition of tolls for waterways would introduce numerous problems. If tolls were insufficient to cover the total annual expenditure necessary to maintain and replace existing facilities it would not necessarily follow that such waterways should be abandoned, since all the benefits of the capital sunk in these enterprises would thereby be lost. Yet any consideration of costs sunk in the waterway would require similar concern over railroad capital which might be similarly underutilized by reason of free or partially subsidized waterway competition. A number of other factors would merit careful attention prior to the adoption of a toll system. The effects upon established water carriers, specific industries, and particular sections of the

[15] Civil Aeronautics Authority, *First Annual Report, 1939*, p. 21.

[16] Discussion of airport income is contained in *Airport Survey*, C. A. A., pp. 52–55. Also see "The Airport Dilemma," *Public Administration Bulletin*, No. 62, 1938.

[17] Federal Coordination of Transportation, *Public Aids*, vol. I, p. 79.

country would require consideration, and difficulties would arise in allocating costs among multipurpose projects. It would also be necessary to determine whether costs attributed to transportation should be charged in full in view of the value of waterways as stand-by facilities and their use in controlling rail rates. Determination of the traffic volume over which costs would be spread, and segregation of traffic not benefiting from waterway improvement would likewise be necessary.

Despite the complications of imposing tolls on inland water transport, the growing magnitude of recent waterway appropriations and the demands for further large-scale expenditure suggest that adherence to economically desirable projects and intelligent priorities is of increasing importance. Accordingly some financial basis appears necessary upon which particular areas and interests which would benefit from a proposed waterway undertaking could assist in defraying the costs. Attention would be focused upon economic issues which have long been obscured by toll-free facilities. For it is difficult to escape the conclusion that failure to attain some degree of self-support for future waterway projects must result in a repetition of the errors and wastes of the past, and in further obstacles to an economic transportation development. Analysis of the possibility of charging tolls might at least suggest abandonment of the most uneconomic projects and impose some restraint upon further plans where their utility is insufficient to induce financial support from those who benefit.

Highways

Unlike waterway and air transport facilities, highways are financed to a considerable extent by direct user charges. These special payments, in the form of motor vehicle taxes, have been previously described as the most important source of highway revenue. Further indication of self-support for highways is found in the expanding use of highway revenue bonds secured by motor-vehicle taxes, and by increasing resort to toll finance for bridge and tunnel projects involving large capital outlays. In addition, a number of States have recently created turnpike authorities with the power to construct toll roads similar to the Pennsylvania Turnpike, indicating that the toll gate, despite its disadvantage in modern highway operation, may play an increasing role in the future if adequate facilities are not otherwise made available.[18]

In spite of the emphasis upon self-support in highway promotion, however, motor vehicle users do not pay the whole highway bill, nor is it suggested that such would be desirable. Many thousands of miles of rural roads providing access to property have assumed their present condition without regard to the requirements of motor-vehicle traffic, and the benefit from such roads is derived chiefly through the use of land. For example, 2,600,000 miles of local rural road, or 83 percent of total mileage in the United States, account for but 13 percent of total traffic. Traffic studies indicate that much of this vehicle movement is concentrated on limited sections, so that a large mileage carrying very little traffic appears to be justified only in terms of providing access to land.[19] Granting that land access is not something apart from vehicle use, financial responsibility for such roads clearly lies with the property owner. In addition, there are several highway functions unrelated to the movement of motor vehicles, these being especially important in urban areas. The city street is an integral part of community organization in terms of providing for light and air, drainage, pedestrian movements, underground utilities, and street cars. Moreover, city streets accommodate the performance of municipal services by vehicles which pay no highway taxes, including fire apparatus, police cars, and other government vehicles, just as rural roads provide governmental services in the delivery of mail and in the operation of army vehicles and school buses.[20] In view of these factors, it does not appear logical that the allocation of highway costs be confined to private vehicle operation to the exclusion of other highway functions.

A solution to the problem of determining responsibility for highway costs was proposed by the Joint Committee of Railroad and Highway Users in 1933,[21] which agreed that motor vehicles should pay the entire cost of the State highway systems and also part of the cost of other rural roads to the extent that such roads "are in general use rather than local use." In addition, vehicles would pay part of the cost of arterial routes in cities. It was suggested that a classification of highways between those of local and of general use "should be made by the authorities in each State in the light of its local conditions." This distinction between general and local use, however, is difficult to explain on theoretical grounds, for the farmer or the city dweller

[18] For a fuller discussion of highway tolls, see Trends in Highway Financial Practices, by Wilfred Owen, Highway Research Board *Proceedings*, 1940.

[19] In the State of Mississippi, for example, there are 62,000 miles of highway carrying less than 10 vehicles a day. In North Dakota there are 87,000 miles in the same category, of which 48,000 carry less than 2 vehicles a day.

[20] "There is a certain minimum standard of highway and street construction which would be essential for the conduct of society and the maintenance of a reasonable standard of living had there never been a motor vehicle." C. S. Morgan in *Public Aids to Transportation*, vol. IX, p. 16. Federal Coordinator of Transportation, 1940.

[21] Joint Committee of Railroad and Highway Users, *Regulation and Taxation of Highway Transportation.*

whose driving is confined in large degree to local facilities pays user taxes the same as motorists on main roads; and this "local" use would seem to warrant recognition in the expenditure of motor vehicle revenue if the user tax is to have justification. It appears, therefore, that except where other uses than private motor-vehicle movements are involved, a more logical basis for distinguishing those roads to be financed by other than motor-vehicle revenues might lie in the excessive road costs per vehicle-mile on lightly traveled land-access facilities in comparison with highways serving any considerable traffic. Segregation would be made at an arbitrary vehicle-mile cost determined by the extent to which it is believed feasible for the heavy-traffic roads to subsidize those producing less revenue. Other roads having vehicle-mile costs high above the average would be considered justified only if the adjacent lands which they served were able to pay for them.

It must be admitted that no perfect scheme can be devised for the expenditure of motor-vehicle revenues under a uniform State-wide charge for road services having widely varying costs. Yet the distribution of travel over all types of roads by the average vehicle has an equalizing tendency, and theoretical perfection is much less to be desired in highway financing than the improvement of administration and other practical considerations. It is believed, therefore, that with the traffic and road-inventory data now available from highway planning surveys it should be possible in each State to designate a motorway system which would be the financial responsibility of the motorist; and to determine which roads should be excluded because the user revenues to which they appear entitled on theoretical grounds would have no practical significance. A system of self-supporting motor roads so determined would seem likely to provide for the most efficient use of highway funds and the most promising approach to the realization of generally higher standards of highway service.

Conclusion

Consideration of the possibilities of financing public facilities through user charges reveals promising indication of future self-support. That exceptions to the self-liquidating principle make rigid adherence to it undesirable has been recognized; and the necessity for a period of financial adjustment during which user charges may be gradually imposed is likewise accepted. None of the limitations which qualify the self-liquidating principle, however, seems to possess sufficient long-run importance to modify the general conclusion that user charges for highways, waterways, and air facilities, in addition to being desirable, are feasible as a method of finance.

FURTHER PROBLEMS IN TRANSPORT PROMOTION

Aside from the matters of financing and of eliminating the effects of subsidy and unfair competition, the provision of public transportation facilities involves problems little different from those which arise in the provision of any other public service. In other words, "the ultimate goal of all transportation policy should be to insure that the people obtain the service they require in the cheapest and most efficient manner." [22] Realization of this objective depends chiefly upon such operating factors as efficient and progressive management, intelligent formulation and direction of future plans, the development of acceptable criteria for economic justification and programming of expenditures, and the furthering of desirable administrative procedure and satisfactory relations among governmental units.

The present section, therefore, will attempt to explore some of these operating problems and to examine the possibilities which their solution offers for greater accomplishment in spending public funds. Such investigation seems particularly necessary at the present time in view of the large-scale potentialities of future public action in the transportation industry. Indeed, if the recent past in transport promotion has been one of large-scale publication, the not distant future portends activity far beyond any previous attainment. Creation and growth of the air industry has already resulted in a Nation-wide demand for airports and airways, and the coming years of expansion will undoubtedly witness gigantic projects for airplane accommodations. In highway building, too, isolated examples of modern design hint at the possibilities of further large-scale construction of good roads to permit the swift and convenient short-run service of which the motor vehicle is capable. Adequate highway approaches to the city and properly located terminal facilities serving the business district are essential public undertakings which every municipality must develop. Little excuse exists for the continued failure of government to eliminate the legal, financial, and administrative obstacles which have thus far prevented the economic accomplishment of a modern road system.

[22] H. G. Moulton and Associates, *The American Transportation Problem*, 1933, p. 881.

Finally, railroad modernization requirements present further extensive scope for public action. Foremost of these needs appear to be the consolidation of terminals and the delimitation of the whole rail system to a pattern which will provide, through coordination of lines and elimination of duplicating facilities, an efficient railroad plant with modern equipment designed for service and economy.

The task of achieving the quality of service feasible in modern transportation will not be a small or simple one. Yet the scattered examples which now exist of the best in air, highway, and rail facilities provide visible encouragement. The most important requirement appears to be an intelligent correction of the deficiencies in current promotional policy and the ability to match management with engineering standards in building a national transportation system for the future.

Intergovernmental Relations

Because Federal, State, and local jurisdictions all participate in the provision of public transportation facilities, public expenditure problems arise through conflicts among units of government relative to such matters as cost sharing, the division of administrative controls, and the selection of the proper unit for performing the work. Failure to arrive at satisfactory solutions among political jurisdictions constitutes a serious obstacle both in the provision of adequate physical plant and in its proper maintenance and operation.

Federal Highway Grants-in-Aid

The regular Federal-aid program for highways, which is perhaps the best example of well-established Federal-State cooperative relations, has raised a number of important policy questions. Among these have been such matters as determining how much highway aid should be granted each year, what formula should be used for distributing this sum among the States, what provisions should be required for State matching, to what purposes expenditure should be directed, and under what conditions Federal grants should be made available.

Amount of aid.—At present the amount of Federal funds regularly granted for highways is a legislative decision based upon the testimony of highway officials as to how much money is needed to assist the States in their roadbuilding programs. This expression of need is in turn tempered by the size of congressional appropriation believed feasible under the general fiscal and political circumstances prevailing. It has been suggested as an alternative to this method that Federal aid should be equal in amount to the annual collection of Federal automotive excise taxes. This proposal has been advanced in view of the fact that similar temporary Federal taxes levied during depression have since been discontinued, hence that retention of the automotive taxes is discriminatory unless the proceeds are dedicated to highway purposes.

Inasmuch as the Federal excise taxes were actually levied for general purposes, however, the viewpoint must be rejected that current Federal automotive taxes constitute benefit levies, and that Federal highway appropriations should equal current Federal tax collections. In the future, however, it might be desirable for a Federal gasoline tax to be levied specifically for highways. This would eliminate the use of general funds on the self-supporting motorway system except for such extraordinary programs as might be required for employment stabilization, defense, or other national purposes; and at the same time it would provide a welcome substitute for the uncertainty of the Federal-aid program under present resort to biennial pleadings in the Congress.[23] The amount of the tax would be sufficient merely to provide funds to promote the Federal objective of directing the States in providing a Nation-wide standard system of highways. In other words, the regular Federal-aid program would function as an administrative device financed by the motorist who benefits.[24] Funds would be distributed among the States in accordance with some expression of highway needs, which vary with such factors as road conditions, traffic volumes, and the varying costs per vehicle-mile of providing adequate highway service. Whether the present distribution practice of giving equal weight to area, population, and rural post-road mileage is adequate to reflect highway needs is open to question, although no better substitute is suggested here.

Cost sharing.—The States and the Federal Government have generally shared in equal amounts the cost of regular Federal-aid highway projects. In States having large areas of public lands, however, the percentage of the Federal contribution is much higher, and a number of western States receive the additional benefit of Federal expenditures for road mileage in national forests, Indian reservations, national parks, and other public lands. Exceptions to the equal matching basis have been permitted, and during the depression matching requirements were waived altogether because of the inability of the States to assume additional financial burdens.

Among the reasons for requiring Federal funds to be matched is the desire that the States be stimulated to

[23] Road hearings would still be necessary, of course, to determine the effectiveness of the Federal program and the adequacy of revenue.

[24] Federal appropriations for Forest Roads and Public Land Roads might continue to be financed from general revenues in view of the general governmental objectives involved.

participate in the provision of the desired services, and that they assume a greater responsibility for projects by reason of participating in their cost. In this way, too, the Federal Government may exert control over the State contribution as well as its own. Critics of State matching provisions have pointed out that States with limited funds may seek to match Federal allotments before meeting necessary maintenance requirements on other parts of the road system, or before adequate attention has been given to roads off the Federal-aid system. There is also speculation as to whether the equal matching basis is the best under normal circumstances, or whether some other division of costs would promote more salutary results. It should be pointed out in this connection that these questions concerning cost sharing among governmental units actually involve the distribution of the tax burden.[25] Different fiscal devices are used by different levels of government, hence different tax incidence results under various matching provisions. Under the equal matching basis for highways in present Federal-aid policy, therefore, the motorist pays half the bill as a use charge, while the other half is raised from general revenue sources. As far as tax incidence is concerned, the proposal to raise Federal aid from user taxes would to a large extent eliminate the problem, since motorists would be paying directly for the whole bill regardless of matching provisions. The practice of requiring Federal aid to be matched, however, would be retained for the purpose of encouraging the States to concentrate road-building efforts on the highways of greatest importance,[26] and to permit Federal administrative supervision over a larger part of the State program.

Use of funds.—The specific purposes for which Federal-highway aid has been granted now include construction on the regular Federal-aid system, construction of secondary roads, and grade-crossing elimination. In the past several years 350 millions of dollars have been appropriated for grade-crossing projects, and currently twice as much is being authorized for this purpose as for the secondary Federal-aid program. Many expensive grade-crossing eliminations, however, cannot be economically justified, since the expenditure of similar amounts for other highway purposes would yield far greater returns in transportation service. It is believed that overemphasis on this part of the Federal-aid program has permitted an unfortunate application of public funds, and that future programs should place the grade-crossing problem in its proper perspective.

Further criticism of the application of Federal aid involves the secondary Federal-aid system. There is reason to question the desirability of designating a separate secondary road system when statutory allowance has already been made for permitting additions to the original Federal-aid system. For in spite of the distinctions expressed to differentiate primary from secondary Federal-aid activities, in practice the amount of traffic has been the chief criterion for programming expenditures on both systems. It would seem, therefore, that the former policy of having one Federal-aid system is preferable to the present situation.

Finally, it is felt that the stipulation permitting funds to be used on extensions of the rural system within municipalities does not sufficiently meet the need for routes through and around the cities, and should be altered to make larger urban expenditures obligatory. Future Federal insistence upon urban highway development should be commensurate with the magnitude of the city problem.

Mention should also be made of possible new conditions upon which Federal aid would be made contingent in order to render the program more effective. For example, Federal participation might call for the limitation of personnel turnover in State highway departments, and the reduction of other political influences in the highway program.

Consideration might also be given to coordinating State regulations as to the use of Federal-aid highways with the engineering specifications upon which the roads were built, so that greater uniformity in vehicle size and weight limitations might be achieved. For under present conditions a road financed with Federal aid and built to carry a specified wheel load is often unnecessarily limited in its use by State laws which prohibit such weights. Still another subject of inquiry concerns the present Federal stipulation that States "diverting" motor vehicle revenues to nonhighway purposes should forfeit part of their allotted share of Federal aid.[27] This rule recognizes the legality of diversions in those States where such practice was in effect when the provision against diversion was passed, so that prohibition of subsequent diversions has had the effect of discriminating among States.[28] These and other questions need to be examined in order that revisions in policy may keep the Federal-aid program adaptable to changing conditions and preserve the suc-

[25] For a full discussion see National Resources Committee, *Division of Costs and Responsibility for Public Works*, 1938, pp. 35–42.

[26] Assuming that a revision of the Federal-aid system and the inclusion of important urban arteries will be effected to designate more precisely the roads of greatest importance.

[27] On the grounds that "it is unfair and unjust to tax motor vehicle transportation unless the proceeds of such taxation are applied to the construction, improvement, or maintenance of highways."

[28] This antidiversion clause has also been attacked as constituting undue control over State fiscal policy.

cess which joint Federal-State action has achieved in this field.

State Highway Grants-in-Aid

The problems created in such number by Federal grant-in-aid policy for highways are more than duplicated in 43 States which grant some 300 million dollars of road aid per year to local units of government. State laws governing amounts of aid and methods of distributing it among the several road systems and political jurisdictions comprise a perplexing legal labyrinth. The general practice is for the State to share with the counties, and in many cases the cities and townships, a percentage of motor vehicle tax collections or gasoline tax revenues or both. This amount is then distributed among the several local units on such bases as population, area, assessed valuation, road mileage, or in accordance with vehicle registrations or tax collections.[29] Some States distribute more than half of total highway user revenues to local governments, while others distribute none; and although grants-in-aid in some cases may by chance reflect traffic conditions, generally there is little connection between amounts of aid and motor vehicle requirements. Legal provisions may be available to enforce the use of these aids for the intended highway purposes, but in numerous States there is not even a knowledge of where or how this money is spent.[30]

It is not difficult to understand, then, why the results of State grant-in-aid programs for roads and streets have been generally unsatisfactory. In the first place the grants have ignored traffic requirements, with the result that money has been lavished upon local rural roads where little traffic exists and at the same time denied the congested metropolitan areas where large-scale expenditure is needed. In the second place, the type of cooperation existing between the Federal Government and the States is generally lacking in relations between the States and localities. Under such conditions it is inevitable that public funds should often be wasted on piecemeal projects, unplanned and of little value to the motorist. In some cases the money is so dissipated that generally only maintenance operations can be financed, and the amount of actual lasting improvements remains negligible. In other cases, where an abundance of aid is received, the opposite wastes are evident, with roads overbuilt in mileage and design beyond any reasonable traffic expectations. There is urgent need, therefore, that the whole State grant-in-aid structure be overhauled in the light of traffic requirements. Until this is done there will continue to be a fundamental contradiction in highway finance resulting from the policy of raising revenue on a use basis to provide highway service, yet spending it without regard to where the service is needed.

In many cases the failure of the local rural road program results from the inherent weaknesses of local road administration. It is generally conceded that the township, which in most cases contains an area of 36 square miles or less, has no place in efficient highway administration. Yet in 18 States the township continues to build roads for the motor vehicle which made the township obsolete. These units, and many counties which are poor or sparsely settled, are generally unable to afford competent engineering personnel, their staffs may be subject to frequent election turnover, and in general undue emphasis is likely to be placed upon political rather than engineering considerations. Short radius of operation makes the use of modern road machinery uneconomical, while small purchases increase the cost of materials and supplies. Finally, variations among units in area, population, taxable value, road mileage, topography, climate, vehicles registered and traffic volumes make underdevelopment and overdevelopment inevitable.[31]

In search of a remedy for these conditions, numerous experiments in road consolidation and administrative centralization have been introduced. In several States all rural roads have been placed under State control, and in others the smaller roadbuilding units have been eliminated. The question of what may be the most desirable solution, both from the viewpoint of local government and of satisfactory highway service, is of paramount importance in each State today. Some indication of where the solution may lie is contained in the suggestion of the previous chapter that roads outside the self-supporting motorway system should be the responsibility of local governments. Possibilities of consolidating the road-building functions of local units in providing this service might then be further explored.

Problems Involving Air and Water Transport

Although the provision of highways creates the majority of problems arising among governmental units, similar issues on a smaller scale are also involved in the promotion of water and air facilities. Previous reference has been made to the extent of local sharing of inland waterway costs; and under existing policies of waterway finance the conclusion seems warranted that

[29] Note that area or road mileage as a basis for distribution would result in overgenerosity to sparsely settled areas having little traffic. Population, registrations, valuation, and tax collections, on the other hand, would tend to favor urban places.

[30] For a summary of State controls over local expenditure, see Highway Research Board *Proceedings*, vol. XIX, 1940, pp. 39–44.

[31] Highway Research Board, *Proceedings*, vol. XVII, 1937. "Problems of Financial Administration."

future projects should properly include such local financial participation as will permit a more equitable tax incidence, and at the same time promote more caution in local initiation of future undertakings. If the proposal that waterways be self-supporting through toll charges were adopted, however, financing would be handled entirely by user charges collected by the Federal Government, with terminal facilities provided locally.

In the case of airways, existing primary routes appear to be the logical responsibility of the Federal Government, although the provision of secondary systems in the future may be in part a State function. Airports present a more difficult problem in the allocation of costs and controls among Federal, State, and municipal jurisdictions. It has been noted that Federal participation in airport development has multiplied in the past several years, accompanied by declining municipal contributions. This situation has been the result of large Federal relief expenditures which should eventually diminish in importance. To what extent the city may hereafter resume its role in airport activities is a difficult question, but it appears that eventually municipal governments must provide airport facilities and impose user charges to pay the bill. This would require the power for local governments to raise revenue from interstate operations.

Perhaps the foremost immediate intergovernmental problems in airport development, however, relate to the coordination of physical plans among Federal, State, and local units. The satisfactory solution of these problems may in turn lead to acceptable allocations of cost.

Conclusion

Harmonious conduct of the transportation industry under a multiple system of Federal, State, and local Governments requires that each jurisdiction be delegated those administrative, operating, and financial responsibilities for which it is most adaptable. Rivalry and hostility among levels of government cannot produce an economically satisfactory condition. It is therefore keenly to be desired that some type of Federal organization be established through which the provision of transportation facilities may be furthered by a proper delegation of functions.

Transportation and Employment

A further expenditure problem having special financial significance concerns the part which employment stabilization objectives should have in transport promotion. The work-relief program to provide employment involved a Federal expenditure on transportation facilities of more than 4 billion dollars in the period from April 1935, through 1940. By far the largest amount was spent for roads and streets, which accounted for $3,739,000,000 of the total. Airway and airport projects absorbed an additional $169,000,000, and navigation facilities $136,000,000. Altogether these transportation relief projects have comprised 30 percent of total expenditures by the Work Projects Administration. The importance of these activities in terms of employment is indicated by the fact that of a total of 2,076,000 workers on W. P. A. projects at the end of 1939, 903,000, or approximately 44 percent, were employed on highway, road, and street projects, with additional thousands working on airports and waterways. Because of the magnitude of this relief activity in the transportation field, and in view of the possibilities of future public works and employment stabilization programs, a review and criticism of past undertakings should be useful.

Highway Accomplishments

Roads and streets have been particularly well adapted to the work-relief program because of the ability of such projects to absorb unskilled labor in large quantities, and because of the ubiquitous need for highway improvements. By 1941, the relief program is reported to have involved 517,000 miles of roads and streets, including some new construction and reconstruction of pavements and bridges, and varying degrees of improvement involving drainage facilities, landscaping, grade-crossing protection, traffic signs, sidewalks, and so on. Some idea of the magnitude of W. P. A. construction accomplishments may be gleaned from the accompanying partial summary:[32]

Construction Work by W. P. A.

		New construction	Reconstruction and improvement
Highways and streets	miles	30,667	25,229
Bridges and viaducts	number	64,426	39,794
Drainage ditch and pipe	miles	60,332	75,203
Sidewalks	do	17,166	6,195
Traffic signs	number	692,000	

Available records specify that new construction on high-type surfaces totaled 6 percent of the mileage on which relief labor was employed, another 5 percent being reconstruction. All other projects, involving 460,000 miles, were on low-type or unsurfaced roads, comprising nearly nine-tenths of all W. P. A. road activity.

The financing of W. P. A. road work has been a joint Federal-local undertaking, with local units of

[32] Facts concerning W. P. A. are contained in a *Report of the President of the United States to the Congress, Emergency Relief Appropriation Acts, 1935–41.* January 1941.

Government generally sponsoring the projects and contributing on the average from 25 to 30 percent of total outlay. A study of sponsorship for the month of August 1937 revealed that in terms of cost, 34 percent of all road projects were sponsored by county governments, 18 percent by State agencies, 10 percent by townships, and 38 percent by municipalities. The accompanying summary of Federal expenditures, to the extent that classification has been possible, reveals the relative emphasis on different types of undertakings attempted in the relief program.

Location and Type of W. P. A. Road Work

	Miles by type		
	High-type	Low-type	Total
Rural roads	33,712	420,894	454,606
Urban streets	22,184	32,248	54,432
Parkways and other roads	1,745	6,648	8,393
Total	57,641	459,790	517,431

W. P. A. Road Expenditures

Highways	$56,000,000
Secondary roads	833,000,000
Streets and alleys	694,000,000
Sidewalks	89,000,000
Roadside development	201,000,000
Bridges and viaducts	45,000,000
Grade-crossing elimination	189,000,000
Other, or classifiable under more than one heading	1,631,000,000
Total	3,738,000,000

Other Relief Transport Projects

Although roads and streets have been the principal facilities to which relief labor has been directed, considerable funds have also been spent for airports, airways, and waterways. Airport activity has included the construction of 197 new landing fields, the extension and improvement of 317 existing fields, and numerous drainage and floodlighting projects. In addition, the following items have been reported:

Construction of Air Facilities by W. P. A.

		New construction	Reconstruction or improvement
Runways	feet	1,971,000	654,000
Airport buildings	number	474	1,088
Airway markets	do	10,493	2,870
Airway beacons	do	67	15

Water transportation has also received attention in relief projects, including such work as the construction and reconstruction of docks, wharves, jetties, and breakwaters:

Construction of Water Facilities by W. P. A.

		New construction	Reconstruction and improvements
Docks, wharves, piers	number	252	250
Artificial channels other than drainage and irrigation	miles	62	182
Jetties and breakwaters	miles	57	2

Appraisal of Transport Projects

Appraisal of the results of W. P. A. expenditure is difficult, and opinion differs considerably as to the transportation value of a dollar spent for work relief compared with one spent through regular channels. It is difficult to obtain an accurate over-all picture of the extent to which the conflict between relief and transportation factors has reduced the useful product, since W. P. A. records fail to provide a satisfactory indication of what has actually been done. Yet the selection of projects in accordance with the location of certified relief labor and execution of the work on the basis of achieving a high ratio of labor to other costs has naturally failed to produce results comparable to the best planning and technological methods. Because insufficient projects were available for immediate execution, those which were selected were of necessity more often ones which could be started soonest rather than those which were needed most. In addition there were obstacles inherent in any relief program, including the inefficiencies which result from poor health and poor morale, and from the discouragement of performing tasks by hand which ought to be performed by machine. Added to these factors have been numerous others working in the same direction, including questionable selection of foremen and supervisors, wage and hour restrictions, prohibition of certain types of work, and the difficulty of adapting problems of local concern to centralized control.[33]

Criticism of Road Work

An unfortunate aspect of the W. P. A. road program has been the rejection by the Federal Government of so many of the lessons learned during the previous two decades of road building. For whereas an important objective of Federal policy had been the designation of a limited system of roads eligible for Federal funds, W. P. A. money has been spent without any system designation; and the developments of improved techniques in road building, long encouraged by Federal research, were supplanted in the emergency by make-work methods. This latter situation is one aspect of

[33] For a poll of county engineer opinion of W. P. A. road work, see "County Roads and the W. P. A.," *Better Roads Magazine*, January 1940. Also, a reply by Perry A. Fellows, "Making Work Relief Work," *Better Roads Magazine*, February 1940.

a general conflict throughout the whole field of public works between the view that public construction has as its primary purpose the creation of jobs, and the opposing view that such works are primarily to develop the national estate.

The current result of the introduction of work-relief programs in road building, then, has been the anomalous situation in which the Federal Government is responsible for two road programs which are basically at cross-purposes. Not only does this criticism hold true of the road policies of the Public Roads Administration and the Work Projects Administration in general, but of their secondary road programs specifically. Under regular Federal aid, the secondary road program applies to a designated system limited to 10 percent of the total rural road mileage in each State. Federal-aid money must be matched on a 50-50 basis by State and local funds. The secondary road program under W. P. A., however, is unrestricted as to project location, and "underbids" the Federal-aid program with much smaller requirements for sponsor contributions.

This conflict between the emergency-relief approach and the transportation-planning approach to road building is diminishing as emphasis in the relief program continues to shift toward defense. Former restrictions on the permissible types of W. P. A. activity have been relaxed, and sponsors' contributions reduced in order to step up the tempo of the work; and there is now a general tendency to stress the nonrelief aspects of W. P. A. As a result, the present conflict in Federal policy may become less one of work-relief versus transportation objectives, and more one between separate approaches to road building as administered by the Public Roads Administration on the one hand and W. P. A. on the other.[34]

Whether the defense program continues to provide a setting for the conversion of W. P. A. into a public-works organization, or whether a return to peacetime conditions may make the work-relief problem once again important, it seems clear that immediate steps are necessary to consolidate Federal road-building efforts. There is hardly justification for two major road-building agencies and two distinct road-building policies. A settlement of this duality, however, requires the difficult admission that work relief has no further place in transportation development. For although the need for providing employment is recognized, as well as the excellent opportunities for employment which are afforded in developing needed transport facilities, it does not follow that work-relief projects rather than public-works projects, afford a proper method of achieving either transportation or employment objectives. For in addition to the fact that work-relief expenditures are less effective than public-works expenditures in providing for positive recovery,[35] the relief experiment has also demonstrated rather unfortunate results in the administration, planning, engineering, and economics of transport promotion. These results, moreover, have been paid for at no small cost, and with material accomplishments which could hardly be called commensurate. Unfortunate also has been the use of relief workers to perform tasks which constitute the normal functions of regular public agencies, creating a tendency to perpetuate relief and to jeopardize the human resources which work-relief proponents had originally hoped to conserve.[36]

Considerable thought is currently being directed to possible solutions of the post-war unemployment problem. In the light of recent experience, therefore, it seems desirable to suggest that the correct solution lies not in further relief activity but rather in the availability of a "shelf" or "reservoir" of public construction projects which will afford an opportunity for applying our resources to needed public works without the stigma of relief. For the idea that government must concern itself with "making" work is hardly defensible when there is so much work to be done.

Transportation Facilities and Defense

Perhaps the most pressing current expenditure problem in the field of transportation, yet one which in spite of its emergency character possesses significant long-range implications, is the provision of facilities adequate for the national defense. Legislative provision for the development of transportation has almost always been partially justified on the grounds of defense. Since 1921, War Department specifications have been an important factor in the design and development of the Federal-aid highway system, and the Merchant Marine Act of 1936 was passed with the objective of providing a merchant marine adequate "to aid in the national defense." This same purpose was likewise expressed in the language of the Civil Aeronautics Act of 1938.

Defense objectives cited on behalf of transport promotion, however, have in the past been more often a

[34] Both these organizations are part of the same Federal Works Agency.

[35] For an explanation of the comparative effectiveness of work-relief and puplic works in combatting depression, see Alvin H. Hansen, *"Fiscal Policy and Business Cycles,"* 1941, pp. 90–95.

[36] According to the then Federal Works Administrator John M. Carmody, "The public interest requires us to strive for the elimination of the means test on public work." W. P. A. workers are even considered in the number of unemployed, "in contrast to the hundreds of thousands of workers engaged in identical types of public work in the twenties, who have always been included in the employed." Excepts from remarks before the Commonwealth Club of San Francisco, Calif., April 19, 1940.

high-sounding phrase invoked to obtain funds than a disinterested desire to preserve the Nation; and the same applies to many current pleas for defense funds which reflect the patriotic feelings of the sponsors. Superhighways from coast to coast and superwaterways equally valueless are paraded forth as the bulwarks of defense, and the sponsors of relief projects of every description give and seek assurances that their programs are of strategic significance.

Although it may be admitted that some defense value derives from almost every justifiable transportation facility, the demand for materials and labor makes priorities necessary. Moreover, essential defense transportation needs must be satisfied, and their urgency leaves no quarter for peacetime projects clothed in the guise of defense. The immediate problem, then, is to determine what new facilities are essential and to what extent existing plant can serve emergency needs through greater operating efficiency. Secondly, it is important to investigate both the short- and long-range effects upon the transportation system which are likely to follow from current emphasis upon war-time considerations.

Highways

In addition to the growth in highway traffic resulting from increased industrial activity, a new responsibility of the road builder is that of providing for a vastly augmented military traffic, and for the movement of defense workers and defense materials in connection with new industrial locations. Two years ago the motorized and mechanized equipment of the Army numbered but 14,000 vehicles, compared with an estimated 286,000 to be attained by the autumn of 1941. This trend promises unprecedented military activity on the highways. In addition, the rapid creation and expansion of defense plants and the establishment of new military reservations has made access roads necessary to provide adequate connections with nearby highways, railways, and airports.

In a report recently transmitted to the President by the Federal Works Administrator, the most immediate task was reported to be the construction of access roads, which on May 1, 1941, involved a preliminary 2,956 miles, with additional mileage to be added with expanding defense activity. A second requirement involves the correction of deficiencies in the strategic highway network designated by the War Department as necessary to meet the military requirements of the national defense. This system, which has been brought close to specified War Department standards over the past two decades, comprises 78,700 miles of main routes. The condition of the rural sections of this strategic network thus far surveyed has disclosed the most serious deficiencies to include 5,095 miles in need of widening, 14,000 miles requiring high-type surfaces, and 2,436 bridges which will have to be strengthened.

In order that the accomplishment of defense road requirements might be possible with the least delay, a number of legislative provisions and cooperative agreements have been made to employ all available road-building resources. The Federal Highway Act of 1940 provides that regular Federal funds made available to the States may be used to cover the engineering and planning costs of defense roads. The act also provides that in the approval of Federal-aid projects the Commissioner of Public Roads may give priority of approval to roads of defense importance. Assistance has also been obtained through W. P. A., which is authorized by the Emergency Relief Appropriation Act of 1941 to supplement by $25,000,000 the normal amounts available for nonlabor costs on projects certified by the Secretary of War or the Secretary of the Navy, thus permitting Federal financial participation up to 100 percent, and serving to expedite defense projects. The possibility of redesignating the Federal secondary system to include new access roads offers further means of permitting Federal financing where no other funds are available. Finally, the Defense Highway Act of 1941 authorizes appropriations of $150,000,000 for access roads; $50,000,000 for improvement of the strategic network; and $10,000,000 for airplane landing and take-off strips along the highways.

In spite of the immediate need for certain highway policy revisions for defense purposes, there is at the same time a need for examining possible effects of the defense program upon normal highway development. The concentration of joint State and Federal-aid expenditure on the designated 78,700-mile strategic system instead of the entire 232,000-mile Federal-aid system suggests that some nonmilitary highway needs may be neglected. The extent of this neglect will depend upon conditions in each State, and upon the length of time that emergency conditions persist. In addition, the designation of access roads as part of the secondary Federal-aid system may be contrary to the best peacetime designation, and therefore call for later revisions. Finally, increased Federal authority in the construction of defense roads indicates still further assumption of State and local highway powers, a trend which must be examined in relation to the long-range problems of highway finance and administration.

Waterways

Modern inland waterway facilities have been justified to large extent with reference to defense. Their availability in the present emergency therefore suggests an examination of how they might best be used to re-

the maintenance of detailed records of all facilities available at every airport in the United States.

A start has been made, therefore, toward a planned program of airport development by the Federal Government, to which are being added numerous State and municipal plans. A recent publication of the State of New Hampshire, for example, outlines a master plan for airports and airways.[42] This report recommends that a State airway system supplementary to the Federal System be established as authorized by the New Hampshire Legislature in 1939, and that landing and navigation facilities be established to serve the airways system. It was further pointed out that every community in the State should consider its relationship to the State airport plan, and that there should be a coordination of landing field development with the programs of neighboring States to avoid wasteful duplication of facilities along State borders. Finally, it was recommended that the highway system should be studied with reference to adjustments necessary to provide adequate access to all landing areas in the State development plan.

The completion of similar studies by such agencies as the Los Angeles County Regional Plan Commission and the New York and New England Regional Plans, and by a growing number of municipalities, illustrates the importance of satisfactory working relations among the various levels of government for purposes of coordination. The value of a Federal coordinating agency through which the numerous State, regional, and local plans might be cleared has been pointed out in a recent study which designates the Civil Aeronautics Administration and the National Resources Planning Board as the two Federal agencies in which there lies "a real responsibility for helping to plan the development of American aviation. and of American airports as a part of aviation."[43]

Highway Planning

Federal.—The first complete assembly of data describing the condition and use of our national highway network was presented to Congress in 1939. This report, prepared by the Public Roads Administration, outlined a large-scale plan for the development of a 26,000-mile Nation-wide system of interregional highways "designed to meet the requirements of the national defense in time of war and the needs of a growing peacetime traffic of longer range."[44] In order to implement this construction plan the Public Roads Administration suggested the creation of a Public Land Authority empowered to acquire, hold, sell, and lease lands needed for public purposes, and to acquire and sell excess lands for the purpose of recouping the increment of value resulting from highway improvements.

State.—In addition to the master plan for a national system of highways, the States have been participating with the Federal Government during the past several years in the conduct of State-wide fact-finding surveys of the condition of the highways, the trends in highway traffic, and the probable necessary physical and financial requirements for adequate highway development. Several States have recently applied these data to the formulation of a State-wide improvement plan. An example of the type of findings upon which future highway programs are being based is provided by the recent Maryland report,[45] which found that failure of the 4,000-mile State primary system of highways to keep pace with the motor vehicle was evident in the following items:

(1) 6,000 sharp curves around which it is unsafe to drive at normal speed.

(2) 1,500 steep grades which delay the free movement of passenger vehicles because of slow-moving trucks.

(3) 16,000 locations where obstructions limit sight distances and produce traffic hazards.

(4) More than 400 inadequate bridges.

(5) Excessive mileage of low-type surfacing which requires heavy maintenance expenditure.

(6) Many miles of deteriorated surfaces.

(7) Inadequate transcity connections.

(8) Inadequate rights-of-way.

(9) Narrow pavements—77 percent of State highway mileage is less than 20 feet wide, whereas present traffic requires a surface width of 20 or 24 feet on all main highways.

Absence of planned development was suggested in the large mileage of unconnected and dead-end sections of road, as well as in the lack of correlation between road design and volume of traffic. For example, 900 miles of road were found to be paved in spite of the fact that very low traffic volumes made paving unnecessary. On the other hand, there was an underdevelopment of 866 miles having low type surfaces but serving heavy traffic. There was also evidence that poor alinement causing early obsolescence had resulted from partial rather than complete route surveys which would have permitted the establishment of final locations in advance of securing rights-of-way. Conditions gener-

[42] *A Plan for the Development of Airparts and Airways in New Hampshire,* State Planning and Development Commission, 1940.

[43] Public Administration Service, op. cit., p. 27.

[44] *Toll Roads and Free Roads,* H. Doc. 272, 76th Cong., 1st sess. (1939).

[45] Maryland State Roads Commission, *Maryland Highway Needs, 1940–60.*

ally similar to these are found in every State where factual reports are available.

c. *Local and regional.*—Considerable groundwork in the planning of highway facilities has been promoted by local and regional organizations, with a number of plans emerging for urban and metropolitan transport, including highway facilities, parking, and freight terminals, and improved methods of mass transportation. A committee of the American Society of Planning Officials recently presented a report on Highways and Transportation in which a number of valuable principles were developed:

1. That no major highway improvement should be undertaken except as part of a comprehensive long-term plan of a major street and highway system of the entire urban area or region, which in turn should be derived through studies and be an integral part of a broader plan of transportation facilities—local, suburban, and long distance—including all forms of transport for the entire urban area or region.
2. That the long-range plan of the coordinated system of transport facilities should, in addition to meeting present and anticipated transportation needs, be in accord with the master plan of development of the community and region.
3. That the need for additional transportation facilities be measured after traffic engineering has been applied to make the most efficient use of existing street and transit facilities.
4. That plans for improvement of existing transportation facilities must be measured in terms of persons carried by various transportation modes; public transit cannot be ignored.

Because the most difficult transport problems lie within metropolitan and municipal areas, the greatest need for highway planning is found there. Comprehensive plans for express highways and parking facilities have been formulated in numerous cities, and actual work on such plans has been accomplished in many. Moreover, it is encouraging that current city plans for transportation reflect in growing degree an understanding that the task cannot be viewed completely without reference to the broader problems and policies of the whole city,[46] and that transportation planning is second only to "a basic land-use pattern as a guide in developing the future city." [47]

Criticism of Transport Planning

Although it has been noted that a certain amount of transport planning is being developed at each of the various levels of government, and that a number of large-scale plans have been formulated for each of the several agencies, in general there has been a complete absence of broad plans to include all forms of transportation, all units of government, and nontransportation as well as transportation objectives. Thus the airport plan has no connection with the highway plan, and the latter is unrelated to railroad plans, in spite of the fact that tremendous savings and improved services could both be achieved through coordination. For example, if it were possible to effect a plan for railroad terminal and line consolidation in metropolitan areas, and then to plan new highway developments in conjunction with rail plans, it might be possible to eliminate the necessity for numerous costly grade separations and to make an economical joint use of bridges and rights-of-way by rail and highway facilities. In rural areas, too, abandoned railroad lines might provide the rights-of-way needed for highways to accommodate substitute bus and truck service.[48] Yet in spite of the billions of dollars of public funds spent annually for transport promotion, no attention has been given to a master plan for directing this expenditure toward the best over-all objectives.

In addition to the lack of coordination of promotional efforts among transport agencies, coordination is yet to be achieved among the various political units providing transportation services. In the case of highways, for example, the adoption of a master plan for roads and streets is subject to countless jurisdictional disputes at State, county, and city lines. In fact, it has been the general practice among large numbers of highway administrators "to view the provision of adequate city streets and adequate rural roads as wholly separate and (when they appear as rival claimants for road user funds) even antagonistic enterprises." [49] Finally, not only must public promotional policy be criticized for the absence of interagency and intergovernmental cooperation, but for failure to coordinate transportation plans with general nontransportation objectives. For there is an intimate relation between the provision of transportation and the use of resources, and transportation can be a highly effective instrument of planning. To cite one type of relation which can be established between transport policy and other government policy, the Public Roads Administration cooperates with the Department of Agriculture in a Nationwide program for better land-use planning in order that the improvement of secondary roads may promote the development of good agricultural land and discourage the use of unsuitable lands. Failure to adjust highway expenditures to land-use patterns re-

[46] Wilfred Owen, "Financing Off-Street Parking Facilities," *Public Management*, April 1941, p. 108.

[47] New York City Planning Commission, *Annual Report, 1940*, p. 38.

[48] A valuable type of railroad-highway planning data is provided through the examination by the Public Roads Administration of railroad abandonment applications filed with the I. C. C. Information so gathered is made available to highway field representatives as a guide to grade-crossing elimination programs and to State highway officials to aid in planning for future highway needs.

[49] H. S. Fairbank, *A Highway Program for the United States*, an address before the Interstate Conference on Automotive Taxation, New York City, October 17, 1939.

sults not only in an unsatisfactory use of land resources, but also in a waste of public funds. "The extensive and even complete abandonment of many miles of highways today is the result of the lack of intelligent planning which characterized the efforts of the 'bubbling good roads booster' of the past." [50]

Need of a Transport Agency

In view of the various planning functions which need to be performed to attain the optimum transportation service and national well-being, the suggestion that a Federal agency be established to review and correlate the now unrelated programs of the various action agencies is hardly more than common sense. It would be the responsibility of this transportation agency to design a master plan for transportation which would bring into focus the several promotional activities of the Federal Government to the end that all transportation as well as general national objectives would be furthered to the greatest possible extent. This objective would be sought through stimulation of planning within each transport agency and each cooperating government jurisdiction, involving the development of techniques and the removal of existing legal, financial, administrative, and political obstacles.

Fear has been expressed that an over-all agency of this type would seek to displace existing action agencies in the transportation field, or that a "coordinating" of transportation would mean the "unification" of all agencies on the same rigid pattern. Particular fears are expressed concerning the air industry, and the possibility that a transportation authority might seek to protect existing facilities by the imposition of restrictive measures on the new. Certainly this danger should be guarded against, but such a possibility seems less likely than the more probable realization of a vastly improved administration of public expenditure.

In order to assure the maximum success of an over-all transportation agency, there should be a clear definition of Federal responsibilities. Among these would be the matter of determining: (1) Whether individual transportation projects are in conformity with the over-all plans of the sponsoring agency; (2) whether such projects form desirable parts of the master transportation plan; (3) whether, in view of business conditions, the timing and rate of transportation expenditure are properly adjusted;[51] and (4) whether a proper correlation exists among Federal, State, and local plans and between transportation and general non-transportation objectives. The need for such comprehensive transportation planning seems unmistakably clear if desirable public promotional activity is to be achieved. Furthermore, in view of the relations existing between transportation and other phases of economic life, the desirability of approaching transport development through broadly conceived plans is difficult to deny.

[50] Wilfred Owen, *A Study in Highway Economics*, Harvard University Press, 1934, p. 31.

[51] Under the Employment Stabilization Act of 1931, Executive Order 8455 now provides for the planning and programming of construction undertaken or aided by the Federal Government to maintain a 6-year advance program of public works. Action agencies report their plans to the National Resources Planning Board and the Bureau of the Budget.

CONCLUSIONS AND RECOMMENDATIONS

The unprecedented magnitude of recent transport promotion by all levels of government has resulted in a phenomenal development of highway, water, and air facilities in the United States. Public action, however, has by no means created the economy and quality of transportation service which such vast expenditures would appear to warrant. Failure to realize the potential safety, speed, economy, and convenience, technologically possible of modern transportation attests the inadequacies of current promotional efforts. Today only isolated examples demonstrate the high standards of accomplishment which government might have achieved.

The reasons which have prevented full realization of the possibilities of public expenditure in the transportation field apparently derive to a large extent from the fact that air, water, and highway facilities have each been furnished separately by independent government agencies acting as special advocates of one form of transportation or another. The coexistence of rail facilities furnished by private enterprise has also introduced inevitable conflicts and inequalities; and it has prevented a coordinated planning of transportation as a whole. Additional factors contributing to an unsatisfactory transportation system have been the vague and confusing objectives of public action, ill-advised subsidies, haphazard programming of expenditures, and the absence of administrative coordination among units of government.

In view of these and other shortcomings, a wholesale revision of American transportation policy is in order if public promotion is to produce a quality of service commensurate with public expenditure. The belief that future transport promotion holds the promise of unparalleled physical accomplishments, if only planning and management can attain the high level reached by engineering standards, makes revision of policy a worthy challenge. Some of the conclusions

and recommendations to be considered in such a revision are the following:

1. Each public facility of transportation should be financed to the maximum practical extent by charges upon users.

a. Airports and airways should be made to approach eventual self-support through the collection of user taxes on aviation gasoline, and by airport fees.

b. The maintenance of inland waterways and future waterway developments should be made contingent upon the possibility of financing through tolls.

c. A State-wide system of motorways should be specified in each State to be financed entirely through motor-vehicle taxes.

d. Federal aid for highways should be provided through a Federal user tax on gasoline, the proceeds of which would be returned to the States on a need basis as a coordinating and administrative device.

2. User charges have the advantage of affording a means of raising adequate revenue, of imposing broad restraints upon public expenditure, and of removing much of the inequality existing among agencies; but they do not provide an automatic guide to investment. Computations of costs and benefits must therefore be made to determine economic justification of transportation projects.

3. Exceptions to the principle of self-liquidation must be recognized when the public interest warrants, these including employment and business stabilization programs, defense projects, and other expenditures designed to further general governmental objectives.

4. If the coexistence of public transport facilities and private railroads still causes serious competitive inequalities, consideration should be given to public provision of the railroad rights-of-way.

5. Plans for transportation development suffer from the absence of any relation among different types of facilities, among governmental units, or with general public objectives. To achieve an over-all approach to transportation development, logic demands the establishment of a Federal transportation agency which would direct the existing transport promotional agencies toward a common goal and aid in the proper assignment of administrative, fiscal, and operating responsibilities among political jurisdictions. The transportation agency, in turn, would be advised as to general government policy through the Congress.

6. In the public promotion of transportation facilities make-work programs to provide employment should be replaced in future emergencies by public works designed not merely to conserve human resources but to accomplish, on the basis of engineering and economic criteria, the maximum amount of public improvements.

These observations, and the preceding pages from which they emanate, constitute no more than a partial expression of the shortcomings in public promotional policy. To many of them, also, exceptions may rightfully be taken. One conclusion, however, it is difficult to escape: That the world's best transportation system is far from being the best possible system; and that deficiencies will persist until unrelated railway, highway, air, and water policies are adequately related to one transportation policy, and the latter to general public objectives.

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PART I, SECTION VIII
GOVERNMENT OWNERSHIP AND OPERATION OF RAILROADS

By Ralph L. Dewey[1]

Introduction

Within recent months there has been a considerable revival of public interest in the question of Government ownership and operation of the railroads. The public has become increasingly concerned over the future of the railroads, and the fears of monopoly which once agitated our elders have been replaced by doubts whether the current policy of regulated private management will prove effective in solving their admitted difficulties. Students of Government ownership of the railroads are actuated, for the most part, not by doctrinaire ideologies, but by practical considerations. "The primary and dominant purpose of public ownership, as of government regulation," says Professor Sharfman, "is to produce the best and cheapest possible transportation service, rendered in the interest of the larger social welfare. The desirability of nationalization must depend upon whether it would tend to improve the service, lower rates, produce greater efficiency, stimulate more progressive management, lead to a more equitable adjustment of conflicting interests, make possible a more desirable development of the character and direction of economic activity—in short, whether it would result in a better transportation system than is possible under private ownership and administration, even when reinforced by a constructive policy of government regulation."[2] The discussion which follows will be conducted in these practical and down-to-earth terms.

The enhanced interest in rail nationalization has come about as a result of recent developments of so serious a nature as to justify consideration of a drastic change in public policy. These developments will be set forth here in order to create a proper setting for later analysis and evaluation of the positive reasons for adopting Government ownership as a new public policy towards the railroads. The reader is accordingly invited to consider for the moment only what is likely to happen in the sphere of public policy, leaving questions of what ought to be done until later. But before we begin a discussion of Government ownership, it is necessary to devote brief notice to another possible alternative to regulation, viz, rail competition.

The alternative of competition.—We might relax regulation in those instances where carrier and agency competition could be expected to produce good service at low cost to the public. It is true that the railroads no longer dominate the field of domestic transportation to the extent they did before the revival of water carriers and the rise of motor carriers. The railroads find that they must improve the speed and flexibility of their service and adjust their rates to meet the competition in order to retain traffic. It seems likely that interagency competition, even with such Government regulation as has been applied to restrict it, has had chief influence in forcing the railroads in recent years to make such improvements in service and reductions in rates as have occurred.

There is something very attractive about the competitive process which compels economic decisions to be made in the hard, objective marketplace. However, to make this policy really effective, it would be necessary to reverse current regulation by eliminating rate and service controls over water and motor carriers, except the extent necessary to prevent monopoly pricing or undue discriminations. It would also probably be necessary to remove many of the detailed rate and service controls now applied to railroads, though not to the same degree as would be desirable in the case of the other two agencies, in order to insure that competition would properly determine the allocation of traffic among agencies and particular carriers.

If there were a reasonable chance that public policy would be redirected along these lines in the near future, it would be advisable to postpone consideration of rail nationalization until a thorough trial of the new policy could be undertaken. It is possible that the experiment would prove to be so successful that the public would no longer be interested in another alternative.

This study has been projected, however, in the belief that the current system of regulation will not be abandoned in favor of the competitive approach, and that the only feasible substitute for regulation of the railroads is Government ownership and operation. Our Government long ago abandoned unregulated competition among the railroads as unworkable, because the

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[2] Sharfman, I. L. *The American Transportation Problem*, p. 193.

industry possessed economic characteristics which were recognized as not being susceptible to control in the public interest by that approach. Allowing for the changed conditions created by new agency competition, it seems likely that greatly relaxed regulation in favor of competition among the railroads themselves would again prove to be unworkable in practice.

The basic questions.—Decision on the necessity and feasibility of Government ownership and operation of the railroads depends upon the answers given to the three following questions: (1) Is there a railroad problem of sufficient magnitude to require the active intervention by Government to secure an acceptable solution? (2) Is the existing policy of regulation doing a satisfactory job of solving the problem and is it likely to do so in the future? (3) Is Government ownership of railroads a feasible alternative to regulation? It is expected that in the analysis which follows, conclusions may be offered with respect to each of these questions.

Developments Justifying Consideration of Change in Public Policy

The developments which are believed to justify consideration of a change of public policy towards the railroads are of a long-run as well as of an emergency nature. The long-run factors are associated with peacetime conditions and are regarded as being pervasive in their effects upon public policy. The emergency conditions are identified with the present war and lend-lease programs, and are thought to be of a temporary, though important, nature. The pervasive elements in the rail picture will now be outlined briefly.[3]

Public promotion of transportation.—The present system of promotion of facilities by public construction and aid has created a competitive situation which raises doubts about the ability of private management to operate the railroads successfully. It is estimated that approximately $65,800,000,000 are now invested in transportation facilities of all kinds in the United States.[4] Of this amount at least $27,000,000,000, or 41 percent, has been contributed by Government. The major share of this public total is invested in roads and streets and the remainder in canals, improved waterways, airways, and railroads. During the 5 years ending in 1940 Federal expenditures for construction of transportation plant and equipment averaged $1,000,000,000 a year. About 85 percent of this outlay was devoted to highway improvement.[5]

Aside from questions of the fairness of these policies to the railroads, which we do not discuss here, it may be true that the carriers are placed in an untenable economic position by such expenditures. It is possible that their "inherent" advantages in service, economy, and efficiency are being partly or wholly nullified by the public assistance accorded to some of their competitors.

If, in fact, rail earnings and credit are jeopardized by transport subsidies, it may be true that the only feasible alternative to an impaired rail position is nationalization of the railroads. Otherwise, the railroads and interests favored by existing arrangements will probably continue their efforts to place hobbles upon their competitors which will have the double-edged effect of protecting vested carrier, employee, shipper, and allied interests and of wasting public investment in new facilities. The passage of the Motor Carrier Act of 1935 and the Transportation Act of 1940 is good evidence that public policy has been directed in recent years toward helping established for-hire carriers, including the railroads, by placing restrictions upon entry into service and by establishing minimum rates. To the extent that this trend in public policy leads to restriction of services, to maintenance of unreasonably high rates, and to restriction in the introduction of new inventions and discoveries, its consequences will be a matter of concern to users.

Rail wastes and inefficiencies.—The second factor which may lead to rail nationalization is the growing public recognition, stimulated by the studies of the Federal Coordinator of Transportation, of the continued wastes, inefficiencies, and excessive duplication of rail facilities and services which are so apparent in the system as it functions today. It is thought by some experts in transportation that proper rail unification of operations and rationalization of plant might result in annual savings of possibly two or three hundred million dollars. Rail managements acting separately or in a flexible association have been unable to eradicate or materially reduce the wastes attributable to private, competitive ownership. The reactions of rail management and labor to the proposals of the Federal Coordinator of Transportation revealed the inability or unwillingness of private elements as presently constituted to introduce the degree of efficiency into rail operations to which the public is entitled. Similar opposition came from particular communities

[3] In a sense, the entire study is concerned with various aspects of the rail problem, and the discussion here will be limited to a summary of the salient factors which are most likely to revive interest in Government ownership.

[4] The total national wealth is said to be $365,000,000,000; on this basis the proportion of national wealth invested in transportation facilities is 18 percent.

[5] Much of the public investment in highway improvements is, as in the case of city streets, not immediately competitive with railroads.

which expected to be harmed by the elimination of wastes.

Unsatisfactory rail finances.—Government ownership of railroads may also come from the repercussions that follow in the wake of objectionable railroad financial practices. In the recent past there have unfortunately been numerous occasions when the public interest was of minimum concern to those responsible for reorganization of bankrupt railroads. The Senate Committee on Interstate Commerce, for example, has characterized the two insolvencies within 10 years of the Milwaukee railroad as "the greatest railroad disaster in our financial history".[6] The first receivership occurred in 1925 in the wake of costly extensions to Puget Sound and the Pacific. This program cost more than a quarter of a billion dollars, which was over five times the original estimates. In order to finance the extensions, the railroad resorted to the practice of increasing its funded debt, which in 1925 was distorted so much that the ratio of bonds to stocks was 2 to 1. The earnings were insufficient to cover debt service requirements and the company failed.[7]

The interested bankers completely dominated the receivership and reorganization proceedings in this case, and constituting themselves as reorganization managers, drew up a plan which was so unsound financially that it was roundly criticized in many quarters. Even the bankers themselves knew that the reorganization plan was weak,[8] yet they forced it through the courts in 1928. The road managed to get along for 2 years without trouble, but it could not withstand the economic depression of the thirties and again went into bankruptcy in 1935. During the period, 1928 to 1935, the Milwaukee's management aggravated the financial situation by uneconomic expenditures and by increasing the debt burden. A loan of 3.5 million dollars was obtained from the Reconstruction Finance Corporation in 1934, after approval by the Interstate Commerce Commission. Several months later, the Milwaukee was in receivership, and it still remains unreorganized in spite of efforts to put a plan into effect.

This is the most famous example of bad financial practices to appear in recent railroad history. But it is not the only important one. The New Haven, Wabash, and Missouri Pacific bankruptcies and reorganizations are also cases in point. The Wabash and Missouri Pacific railroads emerged from bankruptcy about 25 years ago with appearance of a sound capital structure, but each was unable to meet its fixed charges, thus leading in the thirties to further bankruptcy and reorganization.[9] The Senate Committee said, in referring to such cases of financial lack of foresight, "We are therefore dealing, not with ancient history, but with contemporary high finance."[10] The Committee also said, "The speculative era ran its course, and the railroads were left with staggering losses, the investors with defaulted bonds and worthless stocks."[11]

Scarcely less disturbing to the public has been the history of holding company activities in the rail field. The Van Sweringens, for example, operated through many corporations, often with dummy directors, in order to evade the Interstate Commerce Act and also to obtain money from the public. They were able to make a financial football of a large aggregation of railroads without let or hindrance until the depression forced the top-heavy structure into bankruptcy. Within 6 years, the control of the Allegheny Corporation (the Van Sweringen's leading holding company) changed hands "by auction, by sale, by default, by option, by gift, by proxy, and finally by a rental contract on a 2-year lease."[12] Less spectacular but also costly to the public were the holding company activities of the Pennroad Corporation, the Pennsylvania Company, and others.[13]

The railroads were, in many instances, in a poor financial condition during the economic depression of the thirties. More than one-third of them were in bankruptcy and another third experienced difficulties from time to time in meeting their fixed charges. Some of the insolvent carriers have been reorganized and others have taken steps to improve their financial standing. Since the war and lend-lease programs were inaugurated, the entire railroad picture has improved, and gross and net earnings are at the highest levels in a decade. They should experience no difficulty in financing the purchase of new cars, locomotives, and

[6] *Investigation of Railroads, Holding Companies, and Affiliated Companies*, "Chicago, Milwaukee and St. Paul Railway Company," Sen. Rep. No. 25, 76th Cong. 3d sess., 1940, part 18, p. 1.

[7] Other factors contributing to the Milwaukee's failure were the unfortunate spacing of maturity dates of bonds outstanding, so that in 1925 the railroad was confronted with the task of refinancing within a few years obligations totaling about a quarter of a billion dollars; a costly electrification project in the West; the construction of the Panama Canal; the economic slump experienced by the territory surrounding the Twin Cities because of the decline of the lumber industry and the shifting of the flour industry to other parts of the country; and the acquisition of a small carrier in the Chicago area which proved to be a serious financial liability to the company.

[8] *Ibid.*, part 22, p. 41.

[9] *Ibid.*, part 1, pp. 2, 7, 24.

[10] *Ibid.*, part 4, p. 16.

[11] *Investigation of Railroads, Holding Companies, and Affiliated Companies*, "Railroad Combination in the Eastern Region." Sen. Rep. No. 1182, 76th Cong., 3d sess., 1940, part 5, p. 3003. However, the wholesale railroad bankruptcies of the thirties were only in part due to bad financial structures or practices. For instance, the Chicago and Northwestern, the Rock Island, and the Central of Georgia were, on the whole, conservatively capitalized railroads.

[12] Sen. Rep. No. 25, *op. cit.*, part 27, p. 19.

[13] Because of the operations of the Van Sweringen and Pennsylvania holding companies, the Interstate Commerce Act has been extensively amended with a view to preventing similar operations in the future.

other equipment. Both strong and weak carriers, even bankrupts, can obtain such equipment by means of the sale of equipment trust obligations.

The situation is less favorable with respect to the financing of additions to and betterments of ways and structures. The sound enterprises can do a satisfactory job through the issue of securities or the reinvestment of profits. The weaker companies will face difficulties, and probably need Government assistance. Many of these concerns cannot even now sell their stocks to the public on a reasonable basis, nor can their bonds be sold except at oppressive rates of interest. The loans and grants by the Government through the R. F. C. and the P. W. A. to the carriers during the past 8 or 9 years have helped to improve the situation somewhat. But testimony is available to the effect that, quite apart from the need for cars and locomotives, large sums are necessary to rehabilitate and improve the railroad plant.[14] So far as can be seen today, these funds cannot be raised in the ordinary capital markets by the carriers. The Government already is deeply involved in rail financing, being a creditor today for several hundred million dollars. For the most part, the loans have been made to the weak roads, the kind that are most likely to get into difficulties in emergencies. Hence, the Government may find it advisable to take over such roads from time to time in order to protect its investments.

Weakness of regulation.—The current program of transport regulation was advocated at the time of its adoption as the best means of solving the problems facing the railroads and other agencies of transport. The thought in the minds of those who favored regulation was that a great "surplus" of facilities existed and that the carriers were engaging one another in ruinous or cut-throat competition. Such competition was held to be injurious to shippers, travelers, and carriers alike. Many users were supposed to be suffering from inadequate, unreliable service and discriminatory rates. The carriers were supposed to be receiving insufficient traffic and earnings, thus leading to heavy losses and chaotic conditions in the industry. The railroads and their employees were in the forefront of the groups which supported legislation to establish centralized and unified regulation by the Interstate Commerce Commission. Both the Federal Coordinator of Transportation and the Commission also favored these laws. The bus operators and the large for-hire truckers supported the Motor Carrier Act of 1935, and water common carriers joined the other groups named in support of the Transportation Act of 1940.

These laws were patterned after the then existing rail legislation, and featured control of entry into service by new for-hire carriers and establishment of minimum rates. It was clearly the hope of the industry sponsors that by application of the various acts which together make up our transportation law, the supply of facilities and services would be restricted and rates held above the competitive level. Although the established carrier and allied interests doubtless hoped to benefit from the legislation, the public expected the new policy to be instrumental in solving the railroad problem and in preserving private ownership and operation of the carriers.

Has regulation thus constituted made significant strides in solving the railroad problem? We know that the rail management, investor, and employee groups are not satisfied with regulation as it stands. They are even now supporting bills to bring the freight forwarders under Commission control. Doubtless they will eventually endeavor to place curbs on the private motor and water carriers, and the air carriers, since the competition of these carriers is also important. If past experience is indicative of the future, the Commission will probably support such moves. It is fair to conclude that regulation has not solved the rail problem from the point of view of those having vested or special interests in railroads.

Perhaps it will be said that regulation has solved the rail problem in the public interest, even though the carriers themselves have not secured material benefit from it. The proponents are, however, very cautious in making claims on this score. It is said that regulation has had a stabilizing effect, with general benefit to transportation. These views are stated in such vague terms that they are of little help in making an appraisal of the effects of regulation upon the rail problem. Answers of value to the public must get at concrete, specific problems. For example, has regulation led to lower costs and rates, or to better, safer, speedier services, or to improved rail finances? These are long-run considerations. There is also the question whether regulation has been of constructive value in helping to prepare the railroads to play a satisfactory role in the current national crisis.

[14] The Committee of Six, after noting that the railroads had expended 6.7 billion dollars for capital improvements during the 8 years, 1923 through 1930, said that "an average of a billion dollars a year can justifiably be expended in further modernizing and improving their properties, including acquisition of new equipment. This would be in addition to normal expenditures for maintenance." *Report of Committee* to the President, December 23, 1938, p. 35. A similar conclusion has also been reached by Mr. Ralph Budd, President of the Chicago, Burlington, and Quincy Railroad and Transportation Commissioner of the Advisory Commission to the Council of National Defense. In the *Fifteen Percent Case, 1937–38,* Ex Parte 123, he testified that large opportunities for economies from improvements in cars, locomotives, and fixed property were possible and that programs for this purpose "might, when resolved into money, amount to $900,000,000 a year of expenditures on the railway properties of the country." *Reporters' Minutes,* p. 351.

Evidence is lacking to demonstrate that unified and centralized regulation of water, motor, and rail carriers has accomplished a solution of the rail problem in the public interest. The railroads have been permitted on a number of occasions to raise their rates during the past decade,[15] and the shipping public has complained much about high rail rates and undue discriminations. It will be remembered also that for 3 years, 1933–36, the Federal Coordinator of Transportation sought with little success to improve rail organization and functioning. Faced with the powerful opposition of rail management and labor, and of favored communities and shippers, his suggestions were ignored or actively opposed, and his office was not extended. To the extent that legislation of the type of the Motor Carrier Act of 1935 and the Transportation Act of 1940 protects the railroads from pressure to reorganize and improve the industry, it is even more unlikely that needed reforms will be made under regulated private ownership and operation.

The advocates of centralized and unified regulation, as we have already mentioned, have based their policy largely upon the alleged necessity of dealing with the problem of "surplus" facilities and cut-throat or ruinous competition. The railroad business is subject to wide fluctuations in earnings and traffic. Some of these variations are seasonal in character, and being fairly regular in recurrence can be planned for in an efficient manner. Of course, during the slack periods "surpluses" of facilities are bound to occur. But the proponents of regulation a few years ago were not thinking about the seasonal problem. Their concern was with an alleged pervasive, long-run "surplus" which would, if unregulated, outlast the devastating economic depression of the thirties. It is important to note that the talk about the "surplus" in transportation occurred at a time when economic activity generally was at a low level. This condition naturally had severe repercussions on the traffic, earnings, and financial stability of the railroads. It seems likely that the "surplus" was largely a depression phenomenon, probably aggravated by the obsolescence of a portion of the rail plant caused by the rise of competing agencies. At any rate, the "surplus" of rolling stock in rail transportation has already practically disappeared in the wake of boom conditions created by the national defense and lend-lease programs. Now we are confronted with a possible shortage of cars and locomotives, and this condition puts the problem in its true perspective. The rail system must be maintained to meet peak demands, in war as well as in peace, and there can be no "surplus" until it is in a position reasonably to meet such demands.

Those who have been responsible for regulatory policy during the past decade have tried to solve the rail problem by restricting supply, by protecting old and often partially obsolete equipment and practices, and by maintaining rates at high levels, rather than by bending every effort to foster better and more adequate service at the lowest possible costs to users. The emphasis has been on maintenance of the status quo. We may ask whether the makers of regulatory policy propose to modify their program with a view of promoting a rationalized, modern, thoroughly efficient rail system. It is a fair question whether there is still time to do the job with the war upon us, granted the intention to do so. Unless successful accomplishments along these lines are shortly forthcoming, however, the public may devote increasing attention to the possibility of nationalizing the railroads as a feasible alternative means for reaching its objectives.[16]

The war crisis.—The railroad industry under a system of private ownership and operation faces a serious dilemma in a period of grave emergency. To survive as a going concern, the railroads must make sufficient profits not only to avoid bankruptcy but also to provide or attract the necessary new capital for additions and betterments. To accomplish this objective, the carriers must keep a firm control of costs. But costs are not easily held down when prices of materials and supplies and wages of labor rise. Following a threat to strike in the autumn of 1941 unless its wage demands were met, railway labor was granted wage increases which, it is estimated, will add $325,000,000 annually to the pay roll. As a means of offsetting, at least in part, their higher operating costs, the railroads were subsequently authorized by the Interstate Commerce Commission to increase passenger rates by 10 percent and freight rates by varying amounts up to 6 percent. The advances in freight rates, while considerably less than the horizontal 10 percent increase requested by the railroads, except on iron ore, coal, and coke, are nevertheless substantial and will increase the transportation bill of the country more than $200,000,000 per year. For the time being, the expanded volume of

[15] Note particularly the horizontal 10 percent increases on nonagricultural products and 5 percent on agricultural products in 1938. *Fifteen Percent Case, 1937–38*, 226 I. C. C. 41 (1938), and further substantial increases in passenger and freight rates in 1942, Ex Parte No. 148, *Increased Railway Rates, Fares, and Charges, 1942*.

[16] In some quarters, it is asserted that Government promotional policy (public construction of new facilities, Government subsidies and other aids to private operators, taxation, etc.) should be employed in conjunction with regulation as a means of solving the rail problem. However, whether or not transport promotion by Government has been wise or feasible, it is clear that future promotion should not be directed toward safeguarding rail profits and investments. If thus employed, the policy would not tend to solve the rail problem in the public interest, since the effects would be to protect rail rates and wasteful practices.

traffic growing out of the defense and lend-lease programs has yielded increasing net income to the carriers, in spite of rising costs. We cannot be certain, however, that higher rates and greater volume of traffic will continue indefinitely to ward off the adverse effects of higher costs upon income. If net income should fall later, with boom traffic conditions prevailing, we may expect to witness heightened public interest in Government operation and guarantee of earnings as a preferred means of saving the railroads from financial collapse.

Moreover, the railroads face the problem of meeting peak demands for service and must accordingly provide cars and locomotives which in all likelihood will not be required in full numbers after the emergency is over. Rolling stock is costly and hard to get in an emergency; the railroads find that steel, for example, is subject to allocation to other uses by priorities and thus is not always available in sufficient quantities to meet their needs. But they would be confronted by a dilemma even though they could acquire all needed equipment without undue delay. If, on the one hand, they prepare themselves to meet peak demands, their costs mount and their profits are less than they would be otherwise, especially after the boom has passed. If, on the other hand, they delay purchase of new equipment until the need is clearly apparent, they may not be able to get ready in time to meet the crisis, with the result that disturbing shortages appear, necessitating use of priorities, embargoes, and other restrictive devices. Under the latter set of circumstances, the public becomes alarmed and demands are heard that the Government take over the railroads. Since the managements are inclined naturally to follow business principles of maximizing profit, they tend to prefer risking the dangers of a shortage at the peak rather than facing the probability of large idle capacity later on. In this endeavor to practice a business-as-usual policy, they, therefore, expose the industry to a physical breakdown and possibly to Government operation.

This statement has been made for the purpose of setting forth conditions which seem likely to project the Government ownership and operation issue to the fore in the months ahead. Presentation and analysis of the relative merits of the policy will be reserved for treatment in a subsequent part.

History of the Movement for Government Ownership and Operation of Railroads in the United States

Interest in Government ownership and operation of the railroads is not a recent phenomenon in this country. Almost as soon as the railroads first appeared in 1830, State and local governments began to construct lines, even as they had earlier built canals. Chief among the States were Pennsylvania, Illinois, Indiana, Michigan, Georgia, Virginia, and North Carolina. Most of the railroads so constructed were later sold to private interests, usually at considerable loss to the States. However, the States of Georgia and North Carolina still own railroads, though neither one operates its lines. Also at an early date, several municipalities carried on railway projects. The best known and most important of these was the Cincinnati Southern, built and still owned by the city of Cincinnati. This carrier is over 300 miles in length and connects Cincinnati with Chattanooga, Tenn.

The financial failure of most of these early State and municipal ventures into railroad operation was attributable in some part to mismanagement and corruption, but primarily to the over-expansion of facilities which characterized the era. In fact, many of the private projects of the time were equally unsuccessful for similar reasons. The State and local governments were induced to enter the railway business, particularly in the newer sections of the country, because private capital was often not available in sufficient volume to promote the rapid extension of lines demanded by the public.

The Federal Government did not enter the field of rail ownership and operation, even though it had built the National (Cumberland) Road and appropriated considerable amounts of money for other internal improvements. Politically, the pendulum had swung in the direction of "States rights" when Andrew Jackson won the presidency in 1828. While the Federal Government later lavishly aided rail construction with grants of money, land, and credit, it never entered the field permanently as owner and operator except in two minor instances.[17] With the aid of Federal and other government subsidies, the tempo of railroad building gradually speeded up. Although the last Federal land grant was voted by Congress in 1871, the effects of the aid policy continued for a decade or more to stimulate rail construction, particularly in the West. The fact that private enterprise thus assisted by Government gave the country the largest network of railroads in the world undoubtedly had much influence in keeping public policy in favor of private ownership.[18]

Nevertheless, in its famous report in 1874, the Windom Committee of Congress recommended that the Federal Government or the States should own or con-

[17] The Alaska Railroad, begun in 1916, and the Panama Railroad, acquired in 1904.

[18] The financial difficulties encountered by the States between 1830 and 1840, as a result of widespread construction of internal improvements, doubtless had a strong effect upon public opinion against Federal ownership and operation of railroads.

trol one or more railway lines.[19] The committee stressed the need for cheaper transportation, and placed its reliance upon competition, but not private competition. The committee made the acute observation that private rail competition would be ineffective, even if additional lines were constructed, because self-interest would lead inevitably to combinations among themselves and with older carriers.[20]

But the suggestions of the Windom Committee were not adopted by Congress. Rail charges generally declined for several decades after 1874, when the report was written. The question of Government ownership of the railroads remained largely dormant until the World War period. The Federal Government after a brief trial of private operation took over management of the carriers early in 1918. The railroads were returned to their private owners shortly after the close of hostilities.

The Federal control period.—During the period of Federal control of railroads (1918–20), all the carriers were operated as a national system. The objective, not always attained in practice, was to make common and national needs paramount to actual or alleged corporate advantage. With this end in view, terminals, ports, locomotives, cars, and all other equipment and facilities were utilized in common, regardless of ownership. The privilege of shippers to designate routes was disregarded, because direct routing of traffic was known to promote greater speed and efficiency in service. Moreover, previously existing traffic arrangements between carriers were not allowed to obstruct the expeditious movement of goods, while the law against short-hauling of particular roads was not permitted to forestall the establishment of new, more direct through routes to expedite the handling of traffic.

The Railroad Administration adopted many expedients calculated to implement the policies just described. Demurrage rates were increased to expedite the unloading of cars; the "sailing-day" plan was adopted with regard to less-than-carload freight; basic commodities were moved in solid trainloads; by means of a zoning arrangement, cross-hauling of bituminous coal was eliminated; consolidated ticket offices were established and purchasing was centralized; new equipment was standardized; advertising expenses were drastically curtailed; cars and locomotives were used where the need was most pressing and were repaired at the most accessible shops; and terminal facilities were coordinated.[21]

The Plumb plan.—Between the Armistice in November 1918 and the termination of Federal control of the railroads on March 1, 1920 with the passage of the Transportation Act of 1920, the future of the carriers was very widely discussed, and many proposals were made in and out of Congress with reference to a new public policy. One of the proposed solutions was to nationalize the railroads. Among the several plans offered to accomplish this purpose, the one prepared by Mr. Glenn E. Plumb received the most public attention. On behalf of the train service brotherhoods, Mr. Plumb presented his plan to the Senate Committee on Interstate Commerce on February 7, 1919.[22] The Plumb plan provided for Government ownership of all the railroads of the country at a purchase price to be determined by the courts. Operation was to be in the hands of a private corporation organized under a Federal charter. The corporation would be controlled by a board of 15 directors, one-third to be chosen by the operating employees, one-third by the appointed officials, and one-third by the President of the United States. It was proposed that the corporation have no financial investment in the industry, but that it have a nominal capital stock to be held in trust for the benefit of the officials and employees. The Government would lease the carriers to this corporation for operation as a unified system, and the corporation would pay all costs of operation, interest on the Government bonds issued to acquire the properties, and an agreed amount to establish a sinking fund to be used in acquiring and extinguishing the bonds issued by the Government. Any profits remaining after these payments were to be divided equally between the corporation and the Government. The Government's share was to be used for additions and betterments, and the corporation's share was to be distributed as a dividend on the pay roll. As an automatic check on the profits accruing to the employees, the plan stipulated that whenever the net profits received by the Government reached 5 percent of the gross operating revenues, the Interstate Commerce Commission should immediately reduce the rate level sufficiently to pass on the profits to shippers and passengers. Finally, disputes arising over wages, hours, and working conditions were to be decided by a central wage board and by three adjustment boards, each consisting of an equal number of representatives

[19] Sen. Rep. No. 307, part 1, 43d Cong., 1st sess., 1874, pp. 140–161, 242.

[20] As a further check upon railroad monopoly, the Windom Committee also recommended Government improvement of the waterways partly on the ground that they were natural competitors and effective regulators of the railroads.

[21] Sharfman, I. L., *The Interstate Commerce Commission*, part I, pp. 155–156.

[22] *Hearings on Extension of Tenure of Government Control of Railroads*, 65th Cong., 3d sess., vol. I, pp. 985 ff. See also *Hearings* before the House Committee on Interstate and Foreign Commerce on Return of the Railroads to Private Ownership, 66th Cong., 1st sess., vol. I, pp. 594 ff.

of rail officials and employees. The decisions of these boards were to be final, except that in case of a deadlock the dispute was to be settled by the board of directors of the operating corporation. However, the right to strike was reserved to the employees if the decisions were not satisfactory to them.

This plan was put forth as the "first great experiment in industrial democracy on this side of the Atlantic."[23] Mr. Plumb thought it would lead to cheaper and more efficient transportation, promote unified control under Federal auspices, and realize the advantages of allowing the employees to share in the responsibilities of management and to participate in profits earned. But the plan was not received favorably by Congress or the country at large. Aside from the opposition to Government ownership as a matter of policy which was prevalent at the time, many distrusted an arrangement which vested authority over wages, hours, and working conditions in a board composed solely of representatives of the officials and the employees. Since deficits, when incurred, were to be borne by the Government, it was felt that there would be little incentive for the employees to keep wages low. Mr. Plumb countered by arguing that the plan safeguarded the public interest by retaining control over rates in the hands of the Government. However, this would not solve the problem if labor combined to raise wages sufficiently to create a deficit. The burden would merely be shifted from users of the service to taxpayers. In short, the public was not disposed to accept Government ownership as a general policy or the Plumb plan in 1920.[24] The country was in the midst of a severe reaction against war restrictions of all kinds, and demanded a speedy return to "normalcy." The deficits incurred under Federal operation were widely publicized and dire results were freely predicted unless the roads were returned to their private owners. During this period, rail employment reached an all-time peak, and many critics expressed the opinion that there was no real necessity for this volume of employment.

It is regrettable that public opinion at that time was not better informed about the various physical and financial aspects of Federal operation. The appraisal of results was superficial and unfair. It was not until Mr. Walker D. Hines, who succeeded Mr. McAdoo as Director General in 1919, published his *War History of American Railroads* in 1928 that a truer, more comprehensive picture of the period was presented to the public. "The important proposition which deserves to be stressed," he said, "is that the methods and results of Federal control of railroads do not constitute a sound argument either for or against Government ownership and operation. Federal control of railroads strikingly shows the economic burdens and dislocations caused by war, but it throws no reliable light on the merits or demerits of Government ownership and operation of railroads in time of peace."[25] Meanwhile, the country experienced a great expansion of economic activity, accompanied by rising rail earnings and dividends. This was the period of the Coolidge prosperity and the dawn of the "new era." The growing effectiveness of the "new" competition of other modes of transport was not realized by the public or even by many of the rail leaders during the twenties. Public interest in Government ownership practically disappeared by 1925 and did not revive until the painful experiences of the thirties again focused thinking upon this possible solution of the rail problem.

Rail Nationalization Abroad

It is instructive to notice the experience of foreign countries with railroad nationalization. In 1937, about 45 percent of the total rail mileage (788,672) of the world was State owned. If, however, the rail mileage (245,752) in the United States is deducted from the total the Government-owned proportion rises to 66 percent.[26] With the exception of the United States and Great Britain, all the leading nations in the world own all or a significant percentage of their rail systems.

The railroads of Australia, Germany, and Russia, for example, have long been nationalized. The method has been adopted by countries with widely varying economic and geographic characteristics and forms of government. Soviet Russia has merely continued a policy which was originally instituted by Czarist Russia. In Germany, the bureaucratic states first took over the railroads, to be followed by the Imperial German Reich, the Weimar Republic, and the Nazi Reich. And democratic Australia and New Zealand have followed the policy of Government ownership and operation for several generations.

Not only does State-owned mileage abroad predominate, but the trend for many years has been toward Government ownership. After a trial with private operation, the Government of Switzerland took over all the main lines between 1901 and 1909. In 1905, Italy finally decided upon a policy of Government

[23] Statement of Mr. Plumb in the *Independent*, vol. 99, 1919, p. 289.

[24] The mild proposal of Director General William G. McAdoo to the Senate and House Committees on Interstate Commerce on December 11, 1918, that the period of Federal operation be extended for 5 years, or until January 1, 1924, failed to meet with popular favor. Mr. McAdoo expressed no opinion for or against Government management, but felt that a further test of 5 years would disclose the solution.

[25] p. 234.

[26] This constitutes a significant rise in the proportion of State-owned mileage in the quarter century since the eve of World War I. In 1913, State-owned mileage was 32.7 percent of the 685,636 miles then in existence. Deducting United States mileage, the State-owned proportion elsewhere in the world was 52.1 percent.

TABLE I.—*Mileage of Railroads, State and Private, by Countries, 1937*

Country	Miles of Railroad			Percent	
	State	Private	Total	State	Private
Austria	3,602	848	4,450	80.9	19.1
Belgium	3,013	196	3,209	93.9	6.1
Bulgaria	1,996		1,996	100.0	0.0
Czechoslovakia	8,208	175	8,383	97.9	2.1
Denmark	1,542	1,784	3,326	46.4	53.6
Estonia	899	12	911	98.7	1.3
Finland	3,418	115	3,533	96.7	3.3
France [1]	7,258	33,090	40,348	18.0	82.0
Germany	33,461	2,795	36,256	92.3	7.7
Great Britain		20,121	20,121	0.0	100.0
Greece	826	795	1,621	51.0	49.0
Holland	1,263	851	2,114	59.7	40.3
Hungary	4,047	726	4,773	84.8	15.2
Ireland (North)		754	754	0.0	100.0
Ireland (Erie)		2,643	2,643	0.0	100.0
Italy	10,527	856	11,383	92.5	7.5
Latvia	1,993	109	2,102	94.8	6.2
Lithuania	1,045		1,045	100.0	0.0
Luxemburg	86	246	332	25.9	74.1
Norway	2,272	212	2,484	91.5	8.5
Poland	12,349	1,026	13,375	92.3	7.7
Portugal	933	1,210	2,143	43.5	56.5
Roumania	6,955	408	7,363	94.5	5.5
Russia (1935)	50,725		50,725	100.0	0.0
Spain	177	9,940	10,117	1.7	98.3
Sweden	4,676	5,828	10,504	44.5	55.5
Switzerland	1,822	1,855	3,677	49.6	50.4
Turkey in Europe	210		210	100.0	0.0
Yugoslavia	6,398	528	6,926	92.4	7.6
Total in Europe	169,701	87,123	256,824	66.1	33.9
Ceylon	951		951	100.0	0.0
China	6,350	17	6,367	99.7	.3
India (including Burma)	31,670	11,351	43,021	73.6	26.4
Japan (including possessions)	13,132	5,644	18,776	69.9	30.1
Malay Peninsula	1,068		1,068	100.0	0.0
Manchukuo	4,322	941	5,243	82.4	17.6
Thailand (Siam)	1,778	240	2,018	88.1	11.9
Turkey in Asia	3,444	298	3,742	92.0	8.0
Other railways		4,620	4,620	0.0	100.0
Total in Asia	62,715	23,091	85,806	73.1	26.9
Argentina	5,764	17,940	23,704	24.3	75.7
Bolivia	420	1,079	1,499	28.0	72.0
Brazil	15,000	4,676	19,676	76.2	23.8
Canada	23,266	19,004	42,270	55.0	45.0
Chile	3,763	1,826	5,589	67.3	32.7
Colombia	1,115	936	2,051	54.4	45.6
Ecuador	703		703	100.0	0.0
Guatemala		768	768	0.0	100.0
Honduras	65	989	1,054	6.2	93.8
Guiana (British)	84		84	100.0	0.0
Guiana (Dutch)	107		107	100.0	0.0
Mexico	8,499	6,070	14,569	58.3	41.7
Newfoundland	749		749	100.0	0.0
Paraguay		663	663	0.0	100.0
Peru	568	2,045	2,613	21.7	78.3
Uruguay	253	1,514	1,767	14.3	85.7
Salvador		385	385	0.0	100.0
United States excluding Alaska		245,752	245,752	0.0	100.0
Other railways		5,510	5,510	0.0	100.0
Total in Western Hemisphere	60,356	309,157	369,513	16.3	83.7

[1] By decree of Aug. 31, 1937, all French railways were nationalized.

ownership and operation, after resorting to many expedients including Government ownership and private operation. Shortly thereafter, Mexico and Japan nationalized their carriers, and France began to acquire some of the private lines. During and immediately after World War I Canada greatly extended its public network of railroads by constructing the National Transcontinental and by purchasing the Grand Trunk, Grand Trunk Pacific, and Canadian Northern, leaving the Canadian Pacific Railway the only important privately owned and operated carrier in the country.

TABLE I.—*Mileage of Railroads, State and Private, by Countries, 1937*—Continued

Country	Miles of Railroad			Percent	
	State	Private	Total	State	Private
Commonwealth Rys	2,145		2,145	100.0	0.0
New South Wales	6,164	448	6,612	93.2	6.8
Queensland	6,566	269	6,835	96.1	3.9
South Australia	2,529		2,529	100.0	0.0
Tasmania	644		644	100.0	0.0
Victoria	4,721		4,721	100.0	0.0
West Australia	4,359	277	4,636	94.0	6.0
New Zealand	3,336		3,336	100.0	0.0
Other railways		433	433	0.0	100.0
Total in Australasia	30,464	1,427	31,891	95.5	4.5
Algeria	2,264	750	2,014	75.1	24.9
Belgian Congo		2,550	2,550	0.0	100.0
French Congo	2,874	979	3,853	74.6	25.4
British Possessions	8,485	3,549	12,034	70.5	29.5
Morocco	1,111		1,111	10.00	0.0
Portuguese Possessions	962	1,041	2,003	48.0	52.0
Sudan	2,021		2,021	100.0	0.0
Tunis	1,576	273	1,849	85.2	14.8
Union of South Africa	13,195	3,008	16,203	81.4	18.6
Total in Africa	32,488	12,150	44,638	72.8	27.2
Total—World railways	355,724	432,948	788,672	45.1	54.9
Total less United States	355,724	187,196	542,920	65.5	34.5

There seems to be no pattern by which to determine what type of country is most likely to embrace nationalization. It has been adopted by large and small nations, by economically advanced and undeveloped countries, by militaristic and nonmilitaristic peoples, by democracies and by dictatorships. But there seems to be no turning back to a system of private management, once a decision for Government ownership and operation has been reached. "Speaking broadly," said Sir William Acworth, "it is safe to say that nowadays a decision of a nation to acquire its railways is irrevocable".[27] Only under war emergency conditions have significant exceptions to this rule appeared, but these constitute special and temporary cases not characteristic of the general trend.

How successful has this foreign experience been? It is difficult to give categorical answers to this question. The German railways have long been operated with considerable success, both in terms of physical efficiency and financial returns. In fact, it is doubtful if any system on a nationwide basis of comparison—public or private—has been better managed than the German network. In terms of quality of service, the German system compares favorably with that in the United States, which is probably as good as can be found in the world today. Elsewhere, Government management seems also to have given general satisfaction, notably in Switzerland and Japan.

However, serious criticism has been levelled against Government systems. The French Government, for

[27] Acworth, W. M., *Historical Sketch of State Railway Ownership*, p. 27.

example, has long incurred heavy deficits on account of rail operation and guarantee of bond interest. The same financial difficulties have also beset the Canadian and Brazilian Governments. The Australian and Mexican railroad administrations have been indicted on account of their domination by labor groups. Much adverse comment relates to the financial results of public operation, and the point is made or inferred that the financial losses have been due to inefficient and wasteful management. Caution must be exercised in drawing conclusions solely in these terms. In Canada, for example, the Canadian National system evolved by promotional construction into light traffic territories and by acquisition of lines which private capital was unable to opperate successfully. Unfortunately for the subsequent financial showing of the Government the interest on the securities of these carriers was guaranteed when there was no reasonable chance that the carriers could earn enough to cover the charges. Other lines were overexpanded for promotional purposes, even though it was generally known that sufficient traffic and revenues to support the extensions were not likely to materialize for years, if at all. The same forces operated to create financial difficulties in Brazil and to a lesser extent in Australia.

Another reason for financial deficits quite unrelated to the efficiency of management is the rate policy adopted by Government. The Italian and French Governments, for example, have used their control of rates to promote military developments, economic expansion along certain lines, and domestic and tourist travel without regard for profits or costs. Thus, the burden of costs has been shifted from users to taxpayers as a matter of national policy. It follows, therefore, that valid conclusions about the efficiency of Government ownership cannot be drawn merely from a study of earnings. To make a convincing showing against Government-owned railroads it is necessary to demonstrate that the losses are due to inefficient or corrupt management. This needs qualification, however, in those instances where the governments have indulged in unsound rate and promotional policies.

What conclusions of value to us may be drawn from foreign experience? The obvious answer is that no sweeping generalizations can be put forth with safety; each country has to find by experiment what program best meets its particular needs. But it seems clear, nevertheless, that those countries with the best operating records have recruited and retained in official positions able and honest administrators. Salaries have been good and tenure secure as long as the employees maintained satisfactory standards of performance. The rank and file of classified employees have been reasonably well treated in respect to wages, hours, and working conditions wherever Government management has been successful. However, care has been exercised not to give the employees a highly favored status or to permit them to stage strikes. It has been a characteristic of the successful systems that, while high policy decisions have generally been made in a political manner, politics in the crude sense has been held to a minimum in administration of the various systems.

Advantages of Government Ownership [28]

Before expressing judgment on the feasibility of adopting a policy of Government ownership and operation of railroads, it may be useful to review the general advantages and disadvantages claimed for this type of solution of present transportation problems. The claimed advantages may be grouped under seven major heads: (1) Stabilization of the financial situation, (2) provision of adequate finances for needed additions and betterments, (3) provision of a more effective and responsible means of adjusting rates and rate relationships for the promotion of broad economic and social objectives, (4) social desirability of establishing marginal cost prices, (5) lowering the costs of transportation, (6) uniting powers and responsibilities of management, and (7) providing a desirable sphere for making Government investments.

Stabilization of the financial situation.—Acquisition of the railroads by the Federal Government would immediately stabilize the railroad financial situation. Pending a final settlement for the properties, interim rentals might be fixed at a level sufficiently high to prevent the collapse of additional railroad companies and avoid the attendant psychological danger of such collapse.[29] Although approximately one-third of the railroad mileage of the United States is being operated under receivers or trustees, the immediate dangers of further collapse are limited to a few companies, and, to the extent that substantial increases in traffic develop and are handled efficiently, they may be temporarily eliminated. Many roads, however, continue to find it difficult to meet fixed charges even in a period of relatively good traffic volume. The necessity of utilizing progressively more obsolescent equipment to haul additional increments of traffic is likely to augment the difficulties of realizing greater net income out of the enhanced gross earnings.

Provision of adequate finances for needed improvements.—During the past decade railroad expenditures

[28] The sections of the report dealing with the advantages and disadvantages of Government ownership and operation have been largely written by Ernest W. Williams, Jr.

[29] Eastman, Joseph B., "Public Ownership and Operation of Railroads," 187 *Annals of the American Academy of Political and Social Science* 117 (1936).

for maintenance of way and equipment have been curtailed as traffic has fallen off. There is much disagreement as to how far this curtailment of expenditure represents deferred maintenance. However, it may be safely assumed that structures, yards, and equipment not required at low volumes of traffic were allowed to deteriorate. With increasing traffic much of this deterioration must be made good. Moreover, equipment ownership has rapidly declined as older units have been retired; many yards, additional main tracks, and other facilities have been removed; and existing facilities have been adjusted to the reduced traffic flow.

Additions and betterments have been restricted in the face of low earnings. Although spectacular progress in the establishment of modern passenger trains has been made, and over-all improvements in freight and passenger service have occurred, the railroads have not been in a position to take advantage of the rapid advances in technology. The average locomotive has become progressively more aged, the average passenger train has shown little improvement, comparatively few modern freight cars have been added to the inventory, new signaling devices have been applied sparingly, obsolescent shop equipment has been forced to do continued duty, and the possibilities of modern power equipment for track work have not been fully realized. In large part, developments have been prevented by poor business prospects and the difficulties of financing.

Especially in the face of the urgent requirements of national defense, it is possible that large capital expenditures will be required to keep the railroads abreast of the demands imposed by traffic increases. Estimates of the capital needs of the railways differ greatly but mount as high as one billion dollars annually for an extended period. Although a large amount of financing of new rolling stock through equipment trusts has developed, it seems unlikely that any large volume of new capital investment, especially for improved ways and structures, can be obtained in the near future except, perhaps, by a few of the stronger roads.[30]

In the Fifteen Percent Case, 1937–38, the Interstate Commerce Commission found that "the existing basis of rates is not sufficient to maintain in full vigor either rail or water transportation."[31] The Commission accordingly authorized the rails to raise rates 5 percent on agricultural products and 10 percent on other commodities; yet, some of the increases granted in that proceeding either were not made at all or were later lessened by voluntary reductions. Under present conditions of demand and agency competition, it is difficult to maintain a rail rate level adequate to produce sufficient earnings to attract the necessary new capital. Under a system of Government ownership the credit of the Federal Government would be immediately available for the physical improvement of the carriers, for the financing of needed emergency facilities, for national defense, and for the provision of improvements in equipment and fixed property for long-term enhancement of efficiency.[32] The difficulty of obtaining new capital would cease, since public credit would be used as a substitute for private sources.[33]

Provision of a more effective means of adjusting rates.—Specific problems of adjustment have been outlined more definitely and in greater detail in earlier sections. Many of these objectives do not correspond with the short- or long-run private objectives which tend to govern the viewpoint of private managements in the transportation field. One of the major arguments advanced in support of the superiority of Government over private ownership of transportation facilities is the possibility of adjusting rates and services to enable the Government to accomplish desired economic and social aims.[34]

In seeking to promote an optimum production organization in the economy as a whole, it may be quite necessary to offer special inducements to the movement of population and facilities which ignore, to a greater or lesser degree, the costs of transportation. Likewise, efforts to secure adequate diversification of industry, to relieve depressed areas, and to equalize economic opportunities of population in broad areas may require concessions in transportation rates in an effort to promote the desired adjustment. Under the present system of ownership and operation in the transport field, Government compulsion and subsidies would probably be necessary to accomplish such aims.[35]

Fundamental readjustments in the movement of the general rate level, such as one designed to promote lower rates during periods of depression, have been especially difficult to secure under private ownership. The advantages of such policies accrue chiefly in the long run and have important social effects which are not measured in the financial results of privately owned carriers. Under Government ownership and operation, however, social costs could presumably be more accurately measured and reflected in rate relationships.

[30] Emergency and long-run needs should be distinguished. To the extent that improvements or extensions are necessary for strictly emergency purposes and cannot be employed when the emergency is over, it is not unreasonable to ask the Government to make these improvements at its own expense.

[31] 226 I. C. C. 41, 136 (1938).

[32] Eastman, *op. cit.*, p. 117.

[33] Locklin, D. Philip, *Economics of Transportation*, rev. ed., p. 670.

[34] Johnson, Emory R., Huebner, Grover G., and Wilson, G. Lloyd, *Transportation, Economic Principles and Practices*, pp. 248–249.

[35] The railroads, however, have often in the past made low rates for the purpose of developing a given territory or type of enterprise. Such rates in the South, for example, were called "missionary rates."

As a cautionary note, it must be observed that many more powerful instruments are available for implementing public policy and that in many situations the efficacy of rate adjustments in promoting proposed ends can be easily overestimated.

Social desirability of pricing services at marginal cost.—The central point to be made in connection with the policy of marginal (incremental) cost pricing is that, by forgetting "sunk" capital costs and pricing on the basis of added "controllable" costs the best use will be made of established facilities.[36] Where output is below capacity this basis of charging will leave a deficit, so that the public must in such event help support the industry. This help might take one of two forms, subsidization of private enterprise or Government ownership. The advocates of the policy of marginal cost pricing, although recognizing the possibility of subsidizing private companies, prefer the Government-ownership method, apparently because they believe that it is more likely to appeal to the general public than outright private subsidies.[37]

In appraising this thesis it is necessary to distinguish sharply two problems: (a) The problem of achieving the best use of transportation resources, and (b) the problem of levying the costs of transportation, whether on the direct beneficiaries or on the taxpayers. Once the facilities are available, fuller use should be induced up to the point where traffic will yield in revenue just sufficient returns to meet the added cost for which it is responsible. Marginal-cost pricing would accomplish this objective without the present discriminatory pricing so characteristic of the railway rate structure. The public today accepts "prejudice" which is not "undue" as a means of accomplishing fuller use of the plant. But the practice results in some misapplication of resources.

Many aspects of the theory of marginal cost pricing are controversial, but it is questionable whether the fiscal responsibilities involved could properly be assumed by the Government, except perhaps as part of an explicitly adopted depression policy to aid in halting the downward spiral of business activity. There is no equitable reason for asking taxpayers to pay overhead costs but not direct costs. If, however, the effect of such a policy is to accomplish the ends above mentioned, there may be valid economic reasons for its adoption. But it is important to note that there are limits to the extent to which we can depart in our society from the quid pro quo principle in pricing and also to the total burden that tax collections can sustain.[38]

Lowering the costs of transport.—Under Government ownership and operation, it is asserted, many types of economies would bring a substantial reduction in the total cost of transport. Opportunities for decreasing operating expenses should come as a result of unified operation of the entire railroad system.[39] Likewise, the way would be opened for abandonment of unnecessary lines and terminal facilities, pooling of merchandise traffic, consolidation of shops, and pooling of locomotive and car equipment with attendant reductions in empty car and light locomotive mileage. These are substantially the types of economy suggested by supporters of consolidation of railroads into one or a limited number of systems.

Progress in reducing costs of transport might also be expected to result from the accelerated application of modern rolling stock and equipment of all types. Standardization of types and purchases for the Nationwide system as a whole should lead to substantial concessions in price for various types of equipment. Few railroad companies are able, for example, to absorb large numbers of any one type of locomotive, and much locomotive construction must be done largely as small special jobs.

In the field of finance economies are looked for under Government ownership from the possibility of reduced interest rates and gradual amortization of indebtedness. Possible economies would depend, in large measure, upon the price to be paid for the acquisition of the railroads and the nature of the Government securities issued in exchange for the rights of railway owners. Various proposals have been offered with a view to insuring a compensation to railway security holders based, as far as possible, upon existing values and earnings prospects.[40] It is possible, however, that argument would be advanced for payment of the "fair" or rate-making value of the railroads. The extent to which income bonds might enter into the capitalization of a Government-owned system would also have an important influence upon the interest requirements.

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[36] The same point would apply also to true decreasing cost situations and not merely to underutilized existing facilities, provided the demand for the service were elastic.

[37] For fuller statements in support of the marginal-cost theory of rail pricing see Hotelling, Harold, "The General Welfare in Relation to Problems of Taxation and of Railway and Utility Rates," 6 *Econometrica* 242 (1938); and Montgomery, R. H. "Government Ownership and Operation of Railroads", 201 *Annals of the American Academy of Political and Social Science.* 144–145 (1939).

[38] The railroads have made many rates based upon "out-of-pocket" or marginal costs, primarily for competitive reasons. The policy has caused them financial embarrassment under conditions of business depression and diversion of high-rated traffic to competing forms of transportation.

[39] Locklin, *op. cit.*, p. 672.

[40] See, for example, a bill to provide for the creation of a corporation to be known as "United States Railways," which was to possess, control, and own certain property of the carriers. S. 2573, 74th Cong., 1st sess., 1935. See also, "Tentative Plan for Public Ownership and Operation of Railroad Systems of the United States," *Regulation of Railroads*, Sen. Doc., No. 119, 73d Cong., 2d sess., 1934, pp. 82–84.

It is agreed, of course, that the rate of interest on Government bonds is lower than on the bonds of private corporations. It is assumed that these lower interest rates would be available on securities issued to finance acquisition and improvement of the railroads, hence providing a salutary reduction in financing costs. However, there may be a distinct possibility that large capital needs and the probable necessity of compensating some railroad security holders in cash, and, therefore, of finding another market for a portion of the acquisition issues, would result in a rise in the interest rate on Government securities. But very probably, despite the possibility of a generous purchase price and increased interest rate, capital costs could be reduced under Government ownership, providing the Government observed sound economic principles in building or improving the railroads.

One of the outstanding difficulties in carrying privately owned railroads through periods of business distress has been the failure to amortize fixed liabilities.[41] Under Government ownership this might be done, with a consequent successive reduction of capital costs. Of course, to the extent that new capital investment might be needed for additions and betterments, amortization of debt might be retarded.

The present system of ownership, involving Government regulation superimposed upon private management and operation produces, according to advocates of Government ownership, an added and unnecessary cost incident upon restraining private management. In large measure, the expense of maintaining regulatory machinery and the costs to carriers and shippers, as well as governments, of proceedings under regulatory acts would be eliminated. Government ownership would, to a considerable degree, serve as a substitute for regulation, but to some extent regulation by nonoperating authorities would still be required for the protection of the user.

Two additional possible sources of savings under Government ownership may be mentioned. First, under the present system of valuation for rate-making purposes, land is included at its current value. An upward trend in land values, such as may be expected in congested terminal areas, is thus reflected in the rate base. Under Government ownership increases in the value of railway lands need not be considered in the determination of the rate level. Second, in the past heavy costs have been inflicted upon the public by strikes in the railroad industry. Although in recent years there has been little difficulty, strike threats continue to develop at rather frequent intervals. Under Government ownership it is said that strikes and the resulting stoppage of commerce and intercourse would be eliminated. Some suggest that the Government would be a fairer employer of labor, others that the right to strike would be abrogated.

Uniting powers and responsibilities of management.—Under the regulatory method, it is contended by advocates of nationalization of railroads, managerial responsibility is divided between the managements of the carriers and the regulatory bodies.[42] The confusion of authority enables both elements frequently to escape responsibility for the effects of their acts. As a result, a tendency to a stalemate occurs, with neither Government nor private management prepared to make promptly the economic decisions regarding rates and service, which are urgently required in the presence of swift changes in the transportation scene. The ability to escape responsibility, it is alleged, enables management groups to assume a do-nothing attitude.

Under Government ownership it is assumed that both the powers and responsibilities of management would be concentrated in one authority. This would remove the possibilities for escaping responsibility and avoiding pressing issues, promote rapidity and decisiveness of action in dealing with new situations, and enable a definite fixing of blame for inactivity or poor planning.[43]

Desirable sphere for making Government investments.—The Government has followed the policy during the depression of making investments in roads, schools, parks, and many other useful facilities, as a means not only of granting relief to needy persons but also as a method of restoring prosperity to the economy. Depressions have come widely to be regarded as the result of deficient private investment, and when such investment lags the only feasible alternative is the Government commitment of funds. Billions of dollars have already been spent in such fashion by the Federal Government, and plans are now being made for large outlays during the post-war transition period.

A number of responsible economists are of the opinion, in fact, that Government investment of part of the Nation's savings will be necessary much of the time, in view of far-reaching structural changes which have occurred recently in our economy. It is suggested

[41] Whatever is done toward retiring bond issues, it is important that facilities be retired financially when they cease to be of use physically.

[42] This argument is also used by advocates of a relaxation of regulation. See, for example, Taylor, H. G. "Simplification of Railroad Regulation," 187 *Annals of the American Academy of Political and Social Science*, 49–56 (1936).

[43] It should be observed here that many of the difficulties respecting the action of management under the regulatory system also occur in various types of large business concerns as a result of the intricacies of organization. See Morris, Ray, *Railway Administration*, rev. ed., pp. 41–76.

that in a highly developed industrial system, which is not expanding rapidly, reliance will have to be placed more largely in the future than in the past on public investment as a supplement to private investment, in order to achieve full employment and a high national income. Professor Alvin H. Hansen, for example, says that the Nation cannot afford to let its national income fall below 60 billion dollars a year, and he favors a scale of net income-creating governmental expenditures adequate to prevent a fall below this minimum.[44]

If this view is correct, there is a good deal to be said for turning over to the Government important spheres of investment, so that the outlays will not be made for makeshift purposes, as some of them have been in the past. The railroads provide an eligible area in which the role could be played. As a group, they are said to need about one billion dollars of new capital each year in peacetime in order to make economically desirable additions and betterments. The public, as we have seen, is already deeply involved in supplying capital for transportation purposes, and could add the railroads to the list without introducing the much-feared Government competition "with its own citizens" into a new field. There would probably be a better chance of such investment in railroads being self-liquidating, and of not aggravating the debt problem, than is true of most public investment. Obviously, a policy of making Government funds available for rail investments could be best implemented under a system of Government ownership and operation.

Disadvantages of Government Ownership

In opposition to Government ownership of railroads many arguments are offered. The most salient include (1) the danger of political interference, (2) the problem of organization and administration, (3) the possibility of loss of efficiency because of removal of incentives, (4) the cost of acquisition and the burden of unprofitable undertakings, (5) the unworkability of an admixture of Government and private operation, (6) the loss of monopoly position by the railroad industry, and (7) the uncertain future of the railroads.

Dangers of political interference.—This is a many-sided problem, but it largely turns upon possible types of interference with management under public ownership and operation. The dangers of the extension of political patronage into the service are recognized by proponents of Government ownership. They contend, however, that these dangers can be averted by the use of an autonomous, nonpolitical type of enterprise.[45] An extension of the practice of offering positions to political henchmen would be exceedingly unfortunate and would threaten a general decline in the level of railway efficiency. There are many who insist that it would be impossible to prevent political considerations from entering into the appointment and promotion of men under a system of Government ownership and operation. They point out that it is inconceivable that men in authority would disregard politics in selecting managers for the railway enterprise.[46] Moreover, it is claimed that many of the best men could not be persuaded to work in this type of political atmosphere.

It is also argued that serious problems would arise in maintaining a satisfactory rate structure under a plan of Government ownership. While it would seem that there might be less incentive to personal discrimination under Government ownership, the dangers of local or commodity discrimination might be aggravated. Political interference on behalf of special interests or localities in an effort to obtain preferential treatment must be expected, and the type of pressure exerted by sectional interests under the present regulatory system would likely become more insistent. Dissatisfied communities would doubtless seek relief from the Congress, and the pressure might be very difficult to withstand. There might be additional legislation of the Hoch-Smith variety—congressional mandates directing railway management to accede to the wishes of political pressure groups. In part, these difficulties might be obviated by continuing the jurisdiction of the Interstate Commerce Commission over rate relationships. However, there is no assurance that the independence of the Commission would be maintained.

The rate structure of the railroads of the United States has been designed to move the traffic. Although delicately adjusted to the demands of commerce it has exhibited a creditable degree of flexibility and a ready adaptability to new commercial conditions. A threat to the old structure has, of course, appeared in the form of motor carrier competition. The relationships of the class rate structure are distinctly disturbed.[47] However, the general outlines of the structure continue, and

[44] See Hansen, Alvin H. "Economic Progress and Declining Population Growth," 29 *American Economic Review*, 14 (1939). Professor Hansen's views on the necessity of Government investment to supplement private investment because of recent structural changes in the national economy are also found in his testimony before the Temporary National Economic Committee, *Investigation of Concentration of Economic Power*, Hearings pursuant to Pub. Res. No. 113, 76th Cong., 1st sess., 1939, "Savings and Investment," part 9, pp. 3497–3515, 3546–3559. See also his recent book, *Fiscal Policy and Business Cycles*.

[45] Eastman, Joseph B. "Public Ownership and Operation of Railroads," 187 *Annals of the American Academy of Political and Social Science*, 108–109 (1936).

[46] Splawn, Walter M. W., *Government Ownership and Operation of Railroads*, pp. 412–413.

[47] For example, commodities formerly rated in Classes 1 and 2 now frequently move on third-class rates.

new methods are currently being employed to adjust it to the changing conditions.[48]

Another danger suggested in connection with Government ownership is the possibility of unwise construction programs, both in the provision of new mileage and the improvement of existing facilities.[49] Pressure from particular localities or areas for additional lines, service, or special facilities may influence expansion that cannot be justified in terms of traffic offered or in prospect. Pressure from rival communities may result in the construction of monumental new stations or other facilities where existing structures are adequate. Particularly if appropriations for new structures were required from the Congress these pressures might manifest themselves. A process of "log-rolling," similar to that with which we have become familiar in the planning of many types of public works, might apply also to railroad extensions and betterments. A continuation of the powers of the Interstate Commerce Commission over new extensions might lessen the dangers of unwise construction, but it is difficult to see what controls could be applied satisfactorily to improvements on existing lines.

Labor relations, under a system of Government ownership, might be an important source of difficulty. The total number of railway employees may be expected to range from 1,000,000 upwards, constituting with their families a very large group of voters. It is asserted that the influence exerted by such a body of Government employees in behalf of concessions in wages and working conditions would be impossible to resist. It must be remembered, however, that the same danger exists under private ownership. Organized railway labor is able to, and does, exert pressure for favorable legislation, and the Congress has at times enacted laws placing this group of workers in a special class with respect to hours, pensions, and other related matters. The position of labor in such a strategic industry as railroad transportation enables it to bring very strong pressure for wage increases. Whether Government management would more readily yield can only be conjectured. However, since wages comprise some 60 percent of total railway operating expenses, the danger of increased costs from concessions to labor is readily apparent.[50]

Some critics of Government ownership predict a considerable increase in the number of employees engaged to do a given amount of work, arising in part from a tendency toward mediocrity, and in part from rules and regulations requiring additional men to be employed in the performance of certain jobs. These difficulties have already appeared under private ownership, but it is alleged there would be less resistance offered by a nationalized railway system.[51] Under private ownership the means for employing additional men are not available unless productivity is increased, but such a check would have less direct effect on a Government system.

A final important aspect of the problem of political interference is the question of securing an adequate separation of railroad finances from Government finance in general. Such a separation is essential in order to ascertain the financial results, to provide accurate accounting for control of operations, and to impose a satisfactory check upon expenditures for extensions and improvements. Some students of the problem assert that the railroads, if Government owned and operated, should be made self-supporting.[52] To operate them at a profit for the general support of the Government would be to burden shippers for the relief of taxpayers. On the other hand, operation at a deficit would call for subsidy by the taxpayers. Under this view railway surpluses should be employed to reduce rates, improve service, or promote social welfare in some other way, but deficits should be quickly eliminated by economies and if necessary by higher rates.

The use of the autonomous public trust offers an opportunity for accomplishing the desired segregation of funds and has had some success in this connection. However, its use must be decided upon only after consideration of many other factors. On the South African Railways and on certain of the railways of India notable success has been achieved in maintaining a distinct separation of railway finances from those of other departments of Government. It seems, therefore, that there is a good possibility of overcoming this objection.

Problem of organization and administration.—Since the inception of railroad enterprises the problems of organization and administration have been particularly formidable. They arise in large measure from the widespread character of railroad operations and the necessity of having much work performed apart from competent supervision. The inherent dangers of operation, the close relation to the progress of local communities upon the line, and the effects of weather, topography, and similar conditions upon operation

[48] For example, all-commodity and train-load rates. See 226 I. C. C. 387, 455 (1938); 232 I. C. C. 381 (1939); 234 I. C. C. 589, 673 (1939); and 235 I. C. C. 485 (1939).

[49] Canadian experience in this regard is interesting, but not necessarily applicable to possible conditions in the United States. See, however, Fournier, Leslie T. *Railway Nationalization in Canada*, pp. 177–178.

[50] Johnson, Huebner, and Wilson, *op. cit.*, pp. 252, 253; Sharfman, I. L., *The American Railroad Problem*, p. 208.

[51] Splawn, *op. cit.*, pp. 431–432.

[52] Jones, Eliot, *Principles of Railway Transportation*, pp. 542–543.

make it essential that managerial decisions be founded upon an intimate and detailed knowledge of the territory served and the facilities employed. Many small systems have achieved admirable success in dealing with administrative problems. However, the large systems have found it necessary to resort to complex organizations with carefully designated lines of authority. A constant struggle has resulted to harmonize sufficient authority in local units with the advantages of specialization in various branches of the service on a system scale.

A vast organization serving far-flung territory breeds not only problems of authority, but also the wastes and inefficiencies which often seem inherent in large organizations. Prompt action, so necessary in the transportation field, is thwarted by lengthy lines of communication from observers on the spot to men in authority. Interdepartmental jealousies and the lack of opportunity for direct contact between responsible officers give rise to narrow viewpoints and prevent a broad appreciation of the whole operating organization. The mass of detail requiring attention by high executives grows with the extension of the organization and necessitates increasing delegation of authority to chief clerks with a consequent lessening of detailed knowledge of, and close contact with, the practical situation on the property.

It is probably true that the close attention given by private managements to the difficulties of administration has produced satisfactory results even on the largest systems. Opponents of Government ownership point out, however, that a railroad system comprising some 240,000 miles of line is vastly different from even the largest of our present operating units.[53] They hold that efficient unified organization will be impossible of attainment and that the central authority will be so far removed from local conditions as to ignore them in drafting policy. They point out that great differences in climate, industry, agriculture, topography, and countless other conditions over the broad area of the United States require an infinite variety of policies and an adaptability to local conditions which would be very difficult to achieve under unified management. Although many proponents of Government ownership admit this is a serious problem, they hold that it can be solved in time. Obviously, men of very high calibre would be required to manage so vast an enterprise. The question is asked whether such men can be found, and, if so, whether they can be attracted into the Government service.

Loss of efficiency.—Under private management, it is said, the objective is clear cut and definite, viz, to increase net income through the provision of good service at lowest cost. It is asserted that any increased income will be divided among the stockholders, labor, and the public and that the interest of the stockholder makes itself directly felt with sufficient force to control management in the desired direction. Moreover, competition between railroads is held to be very efficacious in promoting the efficiency of the various operating units. Interest in improving service and in experimenting with new improvements is said to be considerable under the competitive system.

The objective of operation might not be so clearly defined under Government ownership, since it would be confused by much discussion of the "public interest" without any precise definition of that term. Competition between roads would cease and, while a substitute might be sought in competition between districts and between divisions of the Government system, it is contended that this type of competition would be less powerful in promoting efficiency. Additional dangers might appear from the advent of less capable managers whose prospects of promotion would be limited. It is known that many State-owned railways have been slow to adopt improvements and to conduct research designed to discover new methods and equipment. However, the maintenance of competition from other forms of transport might provide some incentive for this type of development. It should be noted that competition of the Government system in Canada with its privately owned rival has resulted in a highly efficient and progressive Government railway.

Cost of acquisition and burden of unprofitable undertakings.—Finally, it is urged that the heavy cost of acquiring the railroads, with the accompanying increase in the public debt, makes it undesirable for the Government to take over the railway system. We have already observed, in noting the argument that the cost of capital would be decreased under Government ownership, some of the difficulties attendant upon financing acquisition. It is impossible to say what the cost would be, but it would inevitably add heavily to the debt of the Federal Government. To the extent, however, that a favorable exchange of Government for private securities was effected in the process of acquisition the total volume of debt of the economy might be reduced.

In addition it is pointed out that losses incident to unwise and unprofitable undertakings would, under Government ownership, fall upon the taxpayer. Under Government ownership, bonds issued to construct or acquire facilities which subsequently prove to be un-

[53] The largest railway systems in the United States operate from 10,000 to 15,000 miles of first main track. It is possible that a holding company system modeled upon the American Telephone and Telegraph Company and adapted to railroad use might be successfully applied to the management of larger systems.

profitable continue as a charge upon the enterprise and thus upon the taxpayer.[54] Private investors, however, take their losses when an organization fails, and the reorganized company carries on with a reduced capital structure or is abandoned altogether. Since the railroad industry is at present contracting or at least marking time rather than expanding, the dangers from unwise new construction are probably limited except in the instance of political interference. However, much of the railroad network is in financial difficulty and substantial abandonments are predicted in many quarters.

Unworkability of admixture of Government and private operation.—If Government should take over the railroads alone, the other chief transport agencies would be left in private hands. Hence, the Government railroads would be competing with privately owned vessels, trucks, busses, airplanes, and pipe lines. The opponents of rail nationalization claim to foresee many difficulties inherent in such a situation. For one thing, they fear that when the Government confines its ownership to the railroads, it is likely to discourage the proper development of the privately owned carriers. They think the Government is in a better position to accomplish this result than private rail owners. Reference is made to the experience of some foreign countries where Government railroads are protected from competition by a variety of devices such as punitive taxation of trucks operating more than a certain maximum distance.

It is also asserted that the Government may protect its railroads at the expense of other carriers by failing to build new facilities or failing in other ways to promote additional service. The claim is made that the Government railroads would, if necessary, secure subsidies from the treasury to meet and possibly destroy competitors who otherwise would be able to stay in operation by performing efficient and economical service. This possibility is viewed with concern as not only harmful to competing agencies and the taxpayers but to the users as well.

It is undeniable that this line of reasoning possesses real merit. There is danger that the Government might resort to uneconomic measures to protect its railroads against legitimate competition at substantial cost to other agencies, taxpayers, or users. For this reason, the activities of the officials managing the Government railroads should be subjected to close scrutiny in order to detect as quickly as possible any emerging anti-social tendencies. Once detected, steps should be taken in Congress and by public groups to eliminate the restrictive practices and, if necessary, to remove the offending officials from their positions.

Loss of monopoly position by the railroad industry.—As a consequence of the enhanced competition of the other agencies with the railroads, the view is advanced that the need for Government ownership to curb the virtual monopoly position once held by the railroad industry has passed. The new or revived competition is said to have restored the enterprise and initiative of the railroads which had been largely lost under conditions of regulated monopoly. It is asserted that competition has led to service betterments and the introduction of superior rail equipment. Also credited to interagency competition are the piecemeal rail rate reductions of recent years. The motor and water carriers are said to have complained to the Interstate Commerce Commission to the effect that rail rate reductions have been permitted to an extent adverse to their interests.

Evidence is plentiful that the rising tide of agency competition has had the effect of forcing the railroads to improve their service, especially in speed and convenience, and to lower many rates and charges. In order to retain perishable, valuable, and short-haul traffic, they have been compelled, as a rule, to adjust their rates downward and to give greater recognition to user demands. However, the railroads have been able to maintain a dominant position in the freight-traffic field, particularly in the medium- and long-distance movement of bulky, durable, and low-value commodities. They have also continued to hold perishable traffic in transcontinental territory. Even so, they can no longer practice monopoly pricing of services (including discriminations) to the degree possible before the recent rise of agency competition.

For this reason, the argument that Government ownership is necessary to bring under proper control a monopoly affected with a public interest (in the common law sense) has lost some of its earlier force. But it still remains true that the railroads have the power to discriminate to a significant degree between areas, commodities, classes, and localities. They have also successfully resisted attempts by Government to rationalize and reorganize their plants along more efficient and economical lines. The rail consolidation problem is no nearer solution today than it was in 1920.

Uncertain future of the railroads.—The view is frequently expressed that the future of the railroads is now much less certain than it appeared to be before the development of competing transport agencies. It is particularly difficult to determine their purchase value, so it is said, since their earnings' possibilities

[54] The experience of Canada is again instructive in this connection. A heavy burden of debt is carried by the Canadian National System as a result of the expansion of lines into territories already provided with adequate facilities, and the provision of service on an unnecessarily liberal scale. For amplification, see Fournier, *op. cit.*, pp. 257–260.

are hard to gage. Fears are expressed that, in view of this uncertainty, the likelihod is great that the payments for the properties would be in excess of their actual worth. This danger, coupled with the fact that the Federal budget has been out of balance and the public debt has been increasing for a decade or more, leads critics of rail nationalization to view the policy with misgivings.

This argument seems to lack cogency. The public might purchase the railroads for a price higher than their worth would warrant, but there is no certainty that this would be done. The market value of the railroads is discounted in advance in the trading or the security exchanges. By using an averaging process, based upon market value of securities or capitalization of earnings, the purchase price ought to be reasonably commensurate with economic worth. It would be necessary to have these values determined by competent men aided by a staff of economists, accountants, and engineers familiar with the railroad industry. There is no absolute certainty in the affairs of men, of course, but railroad valuation for purchase would not seem to offer insuperable obstacles.

The point that rail nationalization should not be undertaken because of the unbalanced Federal Budget and rising national debt appears not to carry much weight. If the railroads were to be purchased at a reasonable price, the debt incurred for the purpose would not place any additional burden on the treasury. Capital charges would be met from the revenues received by the railroads. The trouble with the unbalanced budget and rising public debt argument is that it fails to include the assets along with the liabilities in appraising the national balance sheet. Rail debt would not be a matter of concern as long as it bore a proper relation to the value of the properties and as long as interest charges could be met out of earnings.

Government Ownership as a Policy for the United States

A listing of the alleged advantages and disadvantages of Government ownership, without further analysis, conclusions, or recommendations as to policy, is unsatisfactory. Such a discussion contributes little to the advancement of public policy in regard to the question. Most of the literature on the subject is strongly pro or con in its sympathies, and scant attention is given to a balanced account in which shadings of relative merit are adequately presented.

It is necessary to keep in mind the fact that many of the problems of management, whether in the formulation of high policy or in the daily routine of administration, confront Government and private officials alike. Management must constantly readjust rates and rate relationships to meet ceaseless changes in industrial location, in consumer tastes, in population growth, and in the countless other features of economic activity. There is no rule of thumb or scientific formula by which the administrator can reach in each instance a decision acceptable to parties of adverse interest. The disappointed shipper who thinks his transportation bill is too high, at least as compared with that of his competitor, will object strenuously, whether the manager be a Government official or a private executive. Similar difficulties are bound to arise in connection with the adequacy and quality of service provided, and the concessions made in transit, reconsignment, and other privileges.

As difficult as the problems of price and service which users constantly lay before management for solution are the discretionary questions of how much capital, land, and labor resources should be allocated to transportation purposes, how rapidly new inventions and methods should be introduced, and how efficiently labor and other resources should be employed. These problems are especially difficult to resolve in quasi-monopolistic markets in which relatively free competition among sellers and buyers does not operate, because the costs of the resources are not already objectively determined for management.

Pros and cons evaluated.—If we disregard for the moment questions of quality of management and personnel and of politics, vital as they are, there is a preponderance of reason in support of a policy of rail nationalization. First, the Government would be in a position to stabilize rail finances immediately. Investors would no longer live in the shadow of fear of default on interest or principal, and would be willing, therefore, to accept a lower effective rate of return than they now expect to receive. Of course, the Government itself will face a heavy task in effecting an exchange of its securities for those of the owners and creditors of the railroads. The public debt too has been rising for more than a decade, and it will certainly continue on to higher levels as long as the national emergency continues. However, if the carriers are taken over at economic prices, the added burden of Government ownership on the Treasury should be small or nonexistent.

Second, as a result of stabilization of rail finances under Government ownership, the badly needed new capital for expansion and improvement would be more readily forthcoming and at lower cost. This would make it possible to offer the public a better service at a minimum burden of capital costs. Even if the capital costs were not lowered by Government, a proper supply of funds would be available when needed.

Moreover, the Government could greatly improve its handling of the rate problem if it owned and operated the railroads. The disabilities imposed upon its freedom of action as a regulator of private concerns by the Constitution would no longer apply. Long-run considerations of the public welfare could be substituted for the narrow, individualistic interests of private owners and managers. Help in the solution of the great economic problem of our time of how to secure maximum income and full use of our resources would be afforded by the nationalized railroads. Private management has stubbornly resisted efforts to lower the general level of freight rates during the depression. The Commission has been equally reluctant to order general rate cuts. Rate reductions have accordingly been made on a piecemeal basis as conditions from time to time forced changes. Although the net effect of the depression and the increasing competition of other transport agencies was, until 1935 or 1936 at least, probably to lower the rail rate level below its average in 1929, rail rates remained for a decade, on the whole, materially above commodity prices prevailing in the twenties. "Sticky" rail rates have unquestionably acted as one barrier to the rapid recovery of the economic system and indirectly, therefore, of the railroads themselves. The advantages of a flexible rate level policy accrue only in the long run, and, thus, may not appear soon enough in the net income figures of the individual carriers to induce action on their part.

In addition to the rate-level problem, perplexing questions arise in connection with the distribution of the burden of cost among users. Market competitors in particular frequently regard the relationships between the rates they have to pay and the rates their competitors pay of greater consequence than the rates standing alone. It seems likely that the Government could better measure the economic costs and judge their effects in terms of rates charged, as owner than as regulator. Certainly it could make desired adjustments more promptly than is now possible. Its powers over rates, however, should not be used apart from, or inconsistently with, other powerful instruments of public policy, such as credit, price, and fiscal devices.

But will a program of nationalization in this country actually lower costs and improve service? So far as capital costs and the supply of service are concerned, the odds are strongly in favor of an affirmative answer. Those who fear that the Government will go too heavily into debt for unwise plant expansion or improvements tend to overlook the fact that the railroads long ago reached a plateau of development. Railroads for a generation have served every part of the country. For twenty years abandonments of terminals, rights-of-way, and services have been as important as extensions. We may hope that the Government will be equally, if not more, willing than private groups to rid the system of unnecessary lines and facilities, and to avoid unjustified additions to the plant.

Operating costs are more important than capital costs in the rail field. Hence, it is of vital interest to speculate upon the probable effects of Government ownership on operating costs. Opportunities would be immediately available for reductions as a result of unified operation of the entire system. Management could at once eliminate such competitive wastes as excessive duplication of service, roundabout routing and cross-hauling, competitive traffic solicitation, and much interline accounting. The way would also be opened for pooling of the less-than-carload merchandise traffic, pooling of cars and locomotives, unification of terminal operations, and consolidation of the shops. Equipment could be more readily standardized as to sizes and styles, thus reducing the costs of manufacturing original equipment and parts and making it more simple and convenient to make many repairs. After allowing for the diseconomies which inhere in the wastes and inertia of bureaucracies and in the political demands of special interests, a nationalized rail system could probably save several hundred million dollars a year.

The greatest question in many minds is whether the Government will be able to develop and retain rail officials and employees of sufficient ability and public spiritedness to do a satisfactory job. It is realized that many of the weaknesses of Government administration are those inherent in any large-scale enterprise, public or private. To overcome this difficulty, in part, civil service should be extended to the recruitment and promotion of that portion of the personnel which performs standardized tasks. High policy makers and other personnel, whose duties require a large degree of judgment, experience, and training, should be chosen otherwise. The employees should be reasonably well paid, protected against arbitrary dismissal, and guaranteed the right to bargain collectively. The rank and file of classified employees now working for the railroads should be retained under Government ownership as long as they demonstrated their fitness to perform their assigned tasks. For the executives of the nationalized railways the qualifications must necessarily be more rigorous. They must possess technical competence to perform their respective duties, receptiveness to new inventions and methods, and devotion to the public welfare.

It is believed that a sufficient number of individuals qualified to meet these standards are available and can be induced to accept positions in the system. Every effort must be made to protect the public from infil-

tration into the service of incompetent or political appointees. Probably no activity thus far undertaken by the Federal Government has presented difficulties equal to the task involved in operating the railroads. Very likely, public pressure will be applied to the end of requiring efficient operation of the system. Civil-service procedures must be perfected and standards raised to a degree not heretofore realized in practice.

The public will have to be well informed and constantly on the alert lest politics in its various forms and manifestations jeopardize the successful functioning of a nationalized system of railroads. The selfishness which now characterizes the special interests in this field will not quickly vanish and be replaced by high-minded devotion to the public welfare. The overly ambitious executive seeking a better position at a higher salary with greater power over subordinates can be as destructive of good public service as the greedy entrepreneur reaching for profits at the expense of employees or users. But these problems of politics are never finally settled, either under Government or private enterprise. With the aid of a few important safeguards, backed by public opinion, it is reasonable to suppose that Government operated railroads can make a record at least as good as and possibly better than that made by privately operated railroads under regulation.

If a policy of nationalization were adopted, the railways should be owned and operated by a public, non-profit-making corporation with the trustees responsible to the President and Congress and the officers responsible to the trustees. The accounts and records of the corporation should be kept separate from those of other governmental bodies and be open to public inspection on reasonable terms. It is not, however, the purpose here to go into details of organization of such a corporation. For further presentation of a plan of organization, the reader is invited to consider the very helpful suggestions made by the Federal Coordinator of Transportation.

Conclusions of the Federal Coordinator of Transportation.—The Federal Coordinator gave extended attention to Government ownership and operation as an alternative solution of the railroad problem.[55] After weighing the advantages and disadvantages of this method, he concluded that the time was not yet ripe to adopt it in the United States. He expressed the fear that while the plan "contains the greatest potentialities of good" it also has "at the same time the greatest possibilities of harm." The management would have to be supported, according to the Coordinator, by "an enlightened and sustained force of public opinion" if the operation were to be successful and not "under the domination or control of the political branches of the Government."[56] The Coordinator said he had seen no evidence of the "development of a sufficiently strong body of public opinion of this character." He added that it would be dangerous to take so far-reaching a step until the public was ready to embrace, support, and protect it.

The Coordinator opposed rail nationalization also because of the financial and economic condition of the country at that time (1933–34). He pointed out that the debt of the Federal Government exceeded the maximum of the World War period. Moreover, many and very heavy public expenditures in the future could not be avoided. Therefore, argued the Coordinator, "a direct or indirect indebtedness of several billion dollars created by the acquisition of the railroad properties might add materially to this burden, to the extent that such indebtedness were not self-sustaining."[57] The Coordinator stated that no one could definitely foresee what the total amount might be, what fixed interest charges would be imposed, or to what extent the earnings would cover the obligations. The fear was also voiced that the Government would be likely to pay a "relatively high price" for the rail properties it might acquire, since the tribunals (including the Supreme Court), which would determine the compensation to be paid, would be inclined to resolve doubts in favor of the owners of the properties out of sympathy with the individuals who were compelled to part with their holdings. "One can foresee what might happen under present conditions," he said. "It would at once be argued that present railroad earnings are not a fair test of inherent property values, on the theory that the depression is temporary and earnings will be much higher in the future. The possible effect of dollar depreciation would also enter in."[58] The Coordinator felt that the economies obtainable from unified operation might overcome eventually the likely inflated fixed charges created by the conditions just described, but he insisted that there would be difficulty in securing these results quickly because of the problem of dealing with labor and getting the new organization in efficient running order. Consequently, the immediate burden upon the Federal finances might be heavy, and the Coordinator was not prepared to recommend that the budget be exposed to this strain.

The Coordinator noted that the railroads no longer

[55] *Regulation of Railroads*, Sen. Doc. No. 119, 73d Cong., 2d sess., transmitted January 22, 1934, pp. 13–21, and Appendix II, pp. 82–84. See also *Report of the Federal Coordinator of Transportation*, 1934, House Doc. No. 89, 74th Cong., 1st sess., transmitted January 30, 1935, pp. 49–55, and Appendix II, pp. 128–130.

[56] House Doc. No. 89, *op. cit.*, p. 55.

[57] *Ibid.*, p. 53.

[58] Sen. Doc. No. 119, *op. cit.*, p. 21.

held the predominant position in transportation they had enjoyed for so many years. The rise of newer competing agencies had diverted traffic and beclouded the future with grave uncertainties. He also observed that if the railroads alone were acquired there would be a public system of carriers competing with private enterprises, a situation which in his opinion would lead to difficulties.[59]

Although Mr. Eastman was not prepared to advocate rail nationalization, he outlined a plan for the ownership and management of the carriers. He felt that publication of the plan would serve a good educational purpose, since Government ownership of railroads might eventually be forced upon the country by circumstances. According to this plan, the properties were to be owned by a Federal corporation chartered by a special act of Congress, the stock to be nominal in amount and owned by the United States. The corporation was to be called the "United States Railways." The railroads would be acquired, in part, through the debenture bonds of this corporation guaranteed by the Government and, in part, through income bonds or preferred stock not so guaranteed. The management would consist of a board of five public trustees, three to be appointed by the President and the other two, if income bonds and preferred stock were issued, by the holders of these securities. Otherwise, the President would appoint all five members. The term of office would be for 10 years, and the salaries would be the same as those paid to justices of the Supreme Court. The trustees would act as directors of the corporation. The United States Railways would be managed in the same manner as a private corporation, with executive power to control all salaries and wages, free from interference or solicitation by public officials or political party officers. Labor would have, however, the complete right of organization and collective bargaining.

The suggested plan also provided for the establishment of an advisory council of 24 unpaid members selected by groups representing business, agriculture, labor, and other interests. This advisory council would be consulted by the trustees on questions of general policy at the request of either group. The advice of the council on specific matters would be made public, and if the trustees failed to follow such advice their reasons as well would be published. The corporation would pay taxes to the Federal Government in a manner similar to that of a private corporation, and to the States and municipalities provided the latter agreed to uniform taxing provisions approved by the trustees. The trustees would be charged with the duty, as far as possible, to set rates with a view to producing net earnings sufficient to meet all charges, including bond interest and sinking fund provisions. Any surplus earnings would be used for the purchase of new plant and equipment or for retiring debt, as the trustees might decide. There would be no limit to the amount of surplus earnings other than the one fixed by the trustees. The Government would meet any deficits in earnings. However, the plan provided for the repayment of such appropriations as a charge against future earnings under a 10-year amortization plan. The Interstate Commerce Commission would be continued in existence, but its powers would be limited to control of rates, accounting, certificates for new construction, and acquisitions of other transportation agencies. The Commission, however, would have no power to suspend changes in rates.[60]

Types of Government Ownership and Operation

The discussion of Government ownership and operation of the railroads has not thus far been directed to any particular type of Government participation in the railway field. Several possibilities may now be noted, including: (1) Complete Government ownership and operation; (2) Government ownership and operation of selected key carriers; (3) Government ownership and private operation; (4) Government ownership of way and structures with private ownership of equip-

[59] Sen. Doc. No. 89, *op cit.*, p. 55. These appear to be Mr. Eastman's continuing views, as set forth in 1938, *Barron's Weekly*, October 3, 1938, p. 9. Mr. Eastman's conclusions were of interest because for many years he had been an outstanding and outspoken advocate of Government ownership of the railroads. In 1919, for example, he said in a paper delivered before the American Academy of Political and Social Science. "* * * It is my firm conviction that it is unwise to return the railroads to the uncertainties of private financing, and the confusion bound to ensue upon the inauguration of new schemes of public regulation, the raising of rates, and attempts at mergers and the pooling of interests, not to speak of labor complications. The Nation will better conserve its strength and resources if Federal control is continued. * * *" "The Advantages of National Operation," 86 *Annals of the American Academy of Political and Social Science*, 90 (1919). It is true that he later on wavered somewhat on the question of the expediency of rail nationalization. He remarked in 1932 that he was "not urging either immediate or early public operation of the railroads." He went on to say that the necessary preparation and planning for an undertaking of this magnitude had not been forthcoming. He also said the time was not ripe and explained his view by commenting, "Paradoxically, it is not so near to being ripe as it was some years ago. Transportation is now in an era of change. Competition is a bigger factor than it has been for many years. It is difficult to visualize even the near future. Until we can see ahead a little more clearly, at least, I am not ready to advise that steps be taken toward public ownership and operation of the railroads." "A Plan for Public Ownership and Operation," 159 *Annals of the American Academy of Political and Social Science*, 112 (1932). Even so, he stoutly defended at that time the principle of Government ownership, suggested a plan to achieve it, and closed his discussion with a forthright challenge of the tenet that the desire for financial gain is the only motive that will stimulate men to their best endeavors. Mr. Eastman's concluding words were "My very profound belief is that the best things which have been done in the world have been impelled by higher motives than the desire for financial gain, that these higher motives have an influence much more widespread than so commonly supposed, and that the desire for gain, while it may cause people to engage in certain valuable endeavors, rarely, if ever, brings into play the best and most worthy impulses." *Ibid.*, p. 119.

[60] House Doc. No. 89, *op. cit.* pp. 128–130.

ment and private operation; and (5) private ownership and Government operation of plant and equipment.

Perhaps the commonest suggestion is that the Government own and operate all carriers, not counting lines or facilities marked for abandonment. Complete ownership and operation are held to be necessary to achieve fully the objectives of economy and efficiency of operation. But how shall the system be operated? Conceivably, the rails might be merged into one national network and directed by one centralized management. This would avoid division of authority, eliminate competition, and permit the maximum in unification. Yet it would place a million employees and two hundred odd thousand miles of line under one management—a task requiring a very high quality of executive ability for successful operation.

In order to obtain the advantages of more intimate direction of activities, it has been suggested that the Government set up a small number of regional operating divisions, each with a monopoly in its territory to function under its respective set of officials. Questions of high policy, rates, service and efficiency standards, and financing would be decided, however, by a centralized group and not by the regional operating officials.

Another possible method of nationalizing the carriers would provide for Government ownership and operation of selected key roads in various parts of the country. The minor carriers would be left in private hands. This would retain the competitive system to a considerable extent, but would have the advantage of permitting the Government to control competition by pointing the activities of the major lines toward desired objectives. It would also be less burdensome to the Government, whose finances are already severely strained by heavy national defense and other expenditures and commitments. However, it is doubtful whether the small roads, many of which are weak financially, could survive independently of the public system.

A still different approach would nationalize all railroads but lease them out to private companies for operation. In this way it is felt that the advantages of consolidation and coordination could be realized without the dangers of inefficient Government operation. It is difficult to see, however, what incentive for efficiency would remain to management if the chance for profit growing out of risking private property were eliminated.

There is another possible method of setting up a system of Government participation in rail transport. It might acquire title to the fixed facilities—way, structures, bridges, terminals—and lease them to private companies which would own and operate the rolling stock. The fixed property could be let out on any number of alternative bases. The Government might undertake to maintain the facilities or it might stipulate private responsibility for such service. The private companies might be asked to pay full economic costs incurred in the construction and maintenance of the sunk capital goods or they might be permitted to have use of the plant below cost or at no rental at all. This method appeals to many people because it seems best to approximate the present system whereby the Government builds and maintains most highways and waterways but does not generally operate carriers on them.[61] As we have seen, there is a school of thought that wishes to furnish the fixed facilities free of charge to operators in order to promote the fullest possible use of the property. It is argued that in a decreasing cost industry, such as the railroads tend to be, it is socially advantageous to expand operations as long as the users are able and willing to meet the incremental or marginal costs of operation.[61] However, apart from the controversial aspects of this theory of rate making, it is doubtful if the admixture of public and private operations thus proposed would best serve the public interest.

It is conceivable that a mixed system of private ownership and Government operation might be established. This method has been tried in a few countries, including our own during the brief emergency period, 1918–20. There seems to be little to commend this method for long-term use, because the *raison d'etre* for private ownership is risk-taking connected with managerial responsibility. If operating responsibility is transferred to Government hands, it would seem to be sensible also to eliminate entirely any private interest in the system, and thus to place the operation on a nonprofit basis.

Financial and Legal Problems of Acquiring the Railroads

Government ownership involves not only questions of desirability and feasibility in the field of policy, but also the problem of choice of method of acquiring the facilities. This question breaks down logically into two sets of problems, one financial and the other legal. We are primarily concerned in this report with the financial aspects.

Financial problems.—The major financial problem focuses on the valuation which is to be placed upon the properties for the purpose of purchase and the distribution of total value among the classes of outstanding securities. The properties might be valued by one or a combination of several procedures. The simplest method in those instances where the securities

[61] An exception is the Federal Barge Line operated by the Government on the Mississippi and Warrior Rivers.

are frequently traded on the exchanges is to base value upon market prices of the securities over a representative period of time. The period should be long enough to iron out variations due to technical, episodic, or cyclical factors. This method is the most precise and current of them all. It has the further merit of reflecting almost automatically from the hard impartial market place the opinions held by the most expert observers of their destiny concerning the economic outlook of the carriers. The market value method discloses, among other factors, the decline in the value of that portion of the railroad plant which has become obsolete because of its unfitness to render service at rates which the newer competitive forms are prepared to offer. In the writer's opinion this is the best method of determining a value for purchase that can be employed.

Unfortunately, rail securities are often closely held and traded infrequently or not at all on the exchanges. In such instances the market price device cannot be applied to solving the problem. For example, the stock of the Grand Trunk railroad is entirely held in the name of the Canadian Government and there is no way of determining its value on the basis of market quotations. As an alternative, the proposal most often suggested is to capitalize net earnings before interest at an agreed upon rate of return. The amount of earnings, thanks to the Government regulation of accounts and reports, can be easily determined. But not so with respect to the rate of capitalization. Obviously, the rate must be higher than long-term interest rates on high-class obligations such as United States bonds, but it should not be as high as interest rates on highly speculative or risky undertakings. It is not easy to agree upon some intermediate figure which will strike a balance between stability and uncertainty about the future. Probably, informed opinion would concentrate on a figure in the neighborhood of 6 percent as a reasonable rate.

There are, however, objections to either of these methods based fundamentally on the belief that market value, being primarily a reflection of earning power present or anticipated, fails to reflect truly the selling value of the properties. The claim is made that rates are not fixed by competition in an open market but rather are subject to regulation which may keep earnings seriously out of line with the economic importance of the properties. It is also asserted that, as a matter of principle, values of capital goods should be related more nearly to costs of production or reproduction than to earnings.

Those who object to the market-value approach to pricing for sale, advance as an alternative the cost method in one form or another. Where it is possible to do so, resort could be had to value based upon the original cost of the properties still used or useful, less, of course, accrued depreciation. Since reliable data of this nature are seldom available for all the railroad plant, use might be made of cost of reproduction or other data carried on the balance sheet.

It is no mere academic question as to which method of valuation should be employed to fix the purchase price of the properties. At one extreme, rail securities in the hands of the public not long ago had a market value of less than 10 billion dollars.[62] At the other extreme, the railroads carry their capital assets on the books at an investment figure of 26 billion dollars. Certainly the railroads' figure is much too high judged by any reasonable standard of present or probable future value. It represents book investment without proper adjustment for depreciation or obsolescence.[63] The market value of securities represents what investors and traders think of the railroads' future prospects. The views of these people may be unduly pessimistic, yet it is not likely that the low values of rail securities prevailing for several years were grossly exaggerated. As now organized and operated, the railroads probably are worth 12 to 14 billion dollars,[64] which means that the 18-odd billion dollars at face or par value of bonds and stocks outstanding must sell on the average at a heavy discount.

Once the value of the properties is finally determined, the problem of distribution of equities among the classes of securities outstanding will come to the fore. Where the values are sufficient to cover creditor claims the problem will be simple. The creditors can be paid off in accordance with the face value of their bonds and notes, and the stockholders can share the remainder of the valuation in accordance with concepts of justice.

The difficult problems in acquisition cases will arise when the properties are found not to be valuable enough to meet the claims of all the creditors at face value. Allowing for rising earnings and reorganiza-

[62] See Part I, Section V, this report. Note also that the market value of securities in 1929 was only 20.3 billion dollars.

[63] Most carriers apply depreciation at low rates to rolling stock and work equipment as prescribed by the Commission.

[64] On the assumption that the rate of capitalization were 6 percent and the average net railway operating income (after deduction of operating expenses, rentals on equipment, and taxes) were 750 million dollars per year, the market value of the railroads would be about 12.5 billion dollars. The average net railway operating income of the Class I carriers for the 10 years ending in 1940 was 519 million dollars, and for the 10 years ending in 1930 it was nearly 1 billion dollars. It is not unreasonable to suppose that the earnings in the future may average about 750 million dollars, neither reaching the levels attained in the boom days of the 1920's nor falling to the depths of the depression years of the 1930's. However, it would be difficult at this time to acquire the carriers at the figures named because of high current earnings.

tion of bankrupt lines, a substantial proportion of companies will unfortunately fall into this category. The equities might be distributed in order of priority of claim upon the assets. Thus, senior lien mortgage bondholders would take precedence over second and third mortgage bondholders. These in turn would be paid off in full before holders of income bonds and unsecured debentures could receive anything. Where the exact order of priority of claim is definitely known this procedure would have the advantage of simplicity of administration. But the problem is seldom as easily solved as here presented. Even with precedence definitely established, the junior lien security holders would object vigorously to any arrangement which might leave them without any compensation at all. Hence, they suggest that if the properties are not valuable enough to meet fully all creditor claims, each class should receive a pro rata share of the total. Naturally, this proposal is not favored by the holders of the underlying bonds or senior liens on property. It is likely that a compromise of this conflict will be necessary, which will concede something to both sides. Probably, the secured obligations will fare relatively better than the rest, but doubtless all will get something. There is much to be said, also, for including stockholders as well as creditors in these compromises. The details of each arrangement will have to be worked out later, and necessary allowances for variations in mortgage provisions and capital structures from one company to another will have to be made.

Legal problems.—As to the legal aspects of railroad acquisitions, certain obstacles of special importance under our constitutional system must be recognized, and appropriate steps taken to overcome them, if nationalization is to become an accomplished fact. The project will require passage by Congress of appropriate legislation. This act will probably come under the general welfare or common defense clause, and not under powers of eminent domain. The problem of acquisition will be simplest in those instances where carriers are in default on principal or interest on R. F. C. or P. W. A. loans. The Government can directly point the reorganization of the carriers in question toward Government ownership. Reorganizations of carriers now controlled by receivers or trustees, but not having R. F. C. loans, might also be directed toward Government ownership. It is questionable, however, whether the Interstate Commerce Commission and the courts could legitimately confine their approval only to plans of reorganization of bankrupt carriers which would result in Government ownership. Certainly, this would not be possible until Congress voted a change in existing national policy. Court action will doubtedless be necessary where the holders of high-grade securities refuse to part with their holdings except at a high value and for cash. Court action will certainly be necessary to acquire carriers not in debt to the Government (or, if in debt, in a position to repay easily any loans outstanding) or in bankruptcy.

The due process clauses of the fifth and fourteenth amendments operate with special force to protect the property rights of solvent enterprises. Many of our most important railroads, including the Pennsylvania, the Burlington, the Santa Fe, the Great Northern, the Union Pacific, the Chesapeake and Ohio, the Norfolk and Western, and the Louisville and Nashville, are financially robust; hence, the legal problems of their acquisition are formidable. But these questions must be faced, since a rational nationalization of the railroads must begin with the strongest and most important carriers. We should not repeat the crucial error of those countries which have taken over the weak or bankrupt lines, leaving the strong and solvent carriers in private hands. Such a course not only has saddled the Governments with budget draining enterprises, but exposed them to unwarranted attacks at home and abroad by the opponents of Government ownership who have charged that the financial deficits were due to inefficient management and operation. The Government should not be the last haven of refuge for broken-down or bankrupt railroads.

Conclusions

1. Public interest in Government ownership and operation of the railroads has recently revived in this country. The renewed interest has occurred for very practical, down-to-earth reasons. It does not represent any material development of socialistic ideologies, but only a conviction that Government ownership may offer a feasible alternative to the traditional policy of regulating privately owned railroads, since that policy has failed to accomplish rate, efficiency, and financial objectives desired by the public.

The present system of promotion of transportation facilities by public construction and aid has created a competitive situation which raises doubts as to the ability of private management to operate the railroads successfully. This policy may have placed the railroads in an untenable economic position. It may be necessary to nationalize the railroads in order to neutralize the effects of subsidies received by their competitors. If this is not done, it is likely that the railroads will continue their efforts to have legislative restrictions placed upon their competitors. To the extent that such efforts are successful, the protection of established interests will waste public investments already made in new facilities and keep rates high to shippers and travelers.

It seems likely that the continued wastes, inefficiencies, and excessive duplication of rail facilities will not be voluntarily corrected under private, competitive management. The adverse reactions of the carriers and their employees to the proposals of the Federal Coordinator of Transportation revealed their unwillingness or inability to introduce the degree of efficiency into rail operations demanded by the public. Also, the high level of rail freight rates during the depression of the thirties (in relation to commodity prices from 1924–29) accompanied by inferior service in some instances and the existence of interterritorial discriminations and other preferences, are likely to turn attention increasingly to Government ownership and operation of the carriers. The continued objectionable rail financial practices resulting in faulty capital structures and overindebtedness, numerous instances of high finance causing bankruptcy and heavy losses to investors, and holding company manipulations have also led to consideration of nationalization as a means of avoiding repetition of these and similar practices.

The war emergency has aroused anxiety about the physical preparedness of the railroads to meet the unusual service demands already in evidence. Car shortages are in prospect, and if they actually materialize, the railroads will then have to resort to such restrictive devices as priorities, embargoes, and higher demurrage charges. Although this program may accomplish desirable results, it is likely to be insufficient because of the reluctance of the competitive rail managements to cooperate fully, and because the users are inclined to submit to drastic service controls only when they are administered by the Government. On account of physical and operating deficiencies, inherent in the situation, the Government may not be able to rely upon private operation in wartime. As materials and supplies rise in price and the employees demand and obtain higher wages, rail costs are certain to go to higher levels. By threatening to strike the employees have already received a substantial increase in wages which the railroads immediately sought to recover by a request for a horizontal increase of 10 percent in freight and passenger rates. The Interstate Commerce Commission rejected the proposed increases on freight, but did authorize lesser advances on most commodities. Passenger fares, however, were permitted to rise by 10 percent. Should further wage demands be refused because rail finances cannot meet the increases or for other reasons, and a strike is again threatened, the Government may prefer to meet the situation directly as operator rather than as a third party.

2. If rail nationalization were adopted in this country, the Government would be in a position to stabilize rail finances immediately and would make available badly needed capital for expansion and improvement at lower cost than is now possible through private channels. As owner and operator, the Government would be able to make expeditious adjustments in the rate level with reference to the long-run considerations of the public welfare. Also, as owner and operator, the Government could more effectively alter the relationships of rates in line with general public policy. Moreover, the average level of rates could be lowered by this policy. In addition to the financial and rate considerations, operating costs could be reduced by the elimination of such wastes as excessive round-about hauling and duplicated service. Efficiency could be promoted by pooling of cars and traffic and by unification of terminals. A nationalized system of railroads ought to yield savings of several hundred million dollars per year.

The greatest question is whether an organization employing a million men or more could attract and retain officials and employees of sufficient ability and public spiritedness to do the necessary job. To insure a qualified and public-spirited group of employees, great care must be exercised in the recruitment and promotion of all personnel. Wages and working conditions must be made reasonably attractive, and the employees must be protected against arbitrary dismissal and guaranteed the right to organize and bargain collectively. The top executives must be paid relatively high salaries, and be judged solely with reference to their skill, open-mindedness to new inventions and methods, and devotion to duty.

3. If a policy of rail nationalization were decided upon, the carriers should be completely owned and operated by the Government. The properties should be owned by a Federal Corporation chartered by a special act of Congress, the stock to be nominal in amount and owned by the United States. This policy would best achieve the benefits of unified management. The actual operation of the system should be placed in the hands of a limited number of regional offices, each functioning with its respective set of officials.

4. In the acquisition of the railroads difficult financial and legal problems are involved. The major financial problems focus on the valuation to be placed on the properties and the distribution of total value among the classes of outstanding securities. Where the securities are widely held and actively traded on the exchanges, the market-value method is the best; but where the securities are closely held and market value is difficult to determine, capitalization of income is a possible alternative method rather easy to apply once agreement is reached on the rate of capitalization.

Of vital consequence is the matter of choice of method to obtain value of plant. For example, the railroads carry their capital assets on the books at 26 billion dollars. At the other extreme, rail securities in some recent years have been estimated to have a market value of less than 10 billion dollars. Under present boom conditions, the securities are valued considerably above the depression lows, but well below the 26 billion dollars claimed by the railroads as the value of their capital assets. Probably the railroads are not worth more than 14 billion dollars, on the average, as they are now organized and operated. As there will be many instances where the total value of a given railroad is less than the total face value of stocks and bonds outstanding, compromises will be necessary in the distribution of the purchase price among classes of securities.

In order to overcome the legal difficulties of acquisition created by our constitutional system, it will be necessary to enact appropriate legislation to accomplish two somewhat antagonistic results, viz, expediting the purchase of the lines at a reasonable value but without impairing the legitimate rights of the sellers. It will also be necessary for the courts to exhibit outstanding qualities of statesmanship in these acquisition proceedings since aggrieved owners of securities will doubtless start numerous court actions in opposition to proposed purchase arrangements.

PART I—SECTION IX
THE ROLE OF PUBLIC ACTION IN TRANSPORTATION ABROAD

By Ludwig M. Homberger [1]

The Concept of Public Action

Transportation has been a matter of intense public interest in all countries with a remarkable similarity of issues confronting communities in areas of similar economic development, particularly during the period following the World War. Owing to the differences in the concepts of the role which public action must play in shaping transportation policies, the methods adopted for public action have been different in the various countries.

This section of the report discusses the main issues in transportation and the methods of public action used in foreign countries. Completeness is not aimed at, and only issues of special interest will be examined. The section is concerned primarily with problems of peacetime transportation. Developments during the present war are considered in "Emergency Measures of Control and Coordination".

Transportation can be considered both as a public service and as a business. In the Anglo-Saxon countries of America and Europe, the idea that transportation is a part of the business activities of the country is stronger than in other regions of the world. For a long time public action was designed primarily to avoid abuses arising from monopolistic tendencies and to protect private interests, at first, those of the shipper and passenger, and in later periods those of the carrier and the investor. This is still the main objective in Great Britain and in the United States. Public action in these countries has gone beyond this line only to a limited extent. In other countries, for example in Canada and in Germany (before the present regime came into power) certain additional objectives were leading the governments to exercise their power over transportation, such as the development of special areas or of special interests. These included import and export and farming, as well as the promotion of social welfare, particularly the fight against unemployment. In totalitarian states, transportation is used without hesitation as a tool for achieving general national economic and social goals.

In many cases, political considerations have also been a vital factor in dealing with transportation. The German National Railways, for instance, were amalgamated in 1920 primarily in order to increase the powers of the central government; improved efficiency and economy were only of secondary importance.

The role which transportation plays in problems of national defense can hardly be overemphasized. In European countries transportation has always been considered an important matter of strategy. Peacetime activities have included not only a thorough study of the existing transportation facilities and their possible use in emergencies, but also the construction of additional facilities for military purposes and special training of transportation officials as well as preparation of regulations and plans for operations covering all contingencies. Consequently, military considerations have been the incentive for strengthening the position of railroads.

In analyzing the attitude of governments toward the competitive struggle between the different modes of transportation and toward problems of railroad organization, it will be found that fiscal interests have influenced policies when railroad finances have been tied up with public finances. Methods in use in France could hardly be explained without considering this relationship.

The Means of Public Action

The means of public action in transportation are government ownership and operation, regulation, public aids, and taxation. Government ownership and operation is almost entirely limited to railroads. In 1938, according to Julius H. Parmelee's [2] computation, 48 percent of the world's railroad mileage was "state mileage," and 52 percent was privately operated. Within the last decade, the ratio of state mileage has increased owing to the growth of railroad systems in areas where industrial expansion is just beginning (such as Russia, China, Turkey, Iran), as well as to a widespread tendency toward nationalization, which in some cases has as its objective the elimination of foreign influence.

It can be generally stated that private operation prevails in the Anglo-Saxon countries of America and Europe and state ownership and operation in the Latin,[3] Germanic, and Slavic countries of Europe, in

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[2] Parmelee, Julius H., *The Modern Railway*, New York, 1940, p. 601.

[3] With the exception of Portugal. In Spain, the Government has taken over the whole broad gauge (5 ft 6 in) railroad system of 7,725 miles under the law of January 24, 1941. Cf. *Railway Gazette*, London, March 28, 1941, p. 360, and April 25, 1941, p. 471.

the British dominions and colonies and the other countries in Asia, and in Africa. In Central and South America 58 percent is privately owned and operated, 42 percent is state-owned and operated. The last figure includes Mexico, where since May 1, 1938, the national railroads had been operated by the "Workers Administration." This experiment with operation by a union was doomed to failure.[4] By an act passed in December 1940, this form of organization was abolished and the Mexican Government took over the railroads again.

In Great Britain, as in the United States, the total railroad mileage is operated by private companies, whereas in Russia all lines are operated by the Government. Many examples, however, can be cited of systems in which only a part is operated by the government. This is true of Canada, where the Canadian National Railways operate 55 percent of the mileage. In France, where until the end of 1937, 79 percent of the mileage had been under private operation, the right-of-way of all railroads with tracks, bridges, terminals, and shops has been considered an essential part of the "grand voirie" and included in the "domaine publique," private companies being treated as concessionaires.[5] On January 1, 1938, a state company was formed for operation of the main line railroads (65 percent of the mileage). In Germany and in Italy, private operation is greatly limited (8 percent in both countries).

With very few exceptions transportation agencies, other than railroads, are operated by private companies. In specific cases, however, the investment of public money in such companies, made for different reasons, has strengthened the influence of government upon the conduct of the business.

Whether government or private operation is the more desirable form of organization depends primarily on the economic and political situation in a given country. Different aspects of the problems will be presented.

Government regulation of private companies and autonomous public corporations varies widely in scope and intensity. In the United States, since the Transportation Act of 1940, all modes of transportation have been regulated (water transportation to a limited extent only). The intensity of American regulation was aptly described recently by using the term "managerial supervision."[6] Various issues of regulatory policy are discussed in other sections. It might only be mentioned at this point that in Great Britain fewer instances of lengthy and costly regulatory procedure are found than in the United States, where the large number of companies offers greater difficulties for thorough supervision.

Many examples can be cited of the promotion of transportation agencies with government aid. The only country where there is almost no instance of substantial government subsidies to railroads in modern times is Great Britain.[7] In other countries, such as France and Canada, railroads have been a drain on public finances for considerable periods. Highways and waterways are built, improved, and maintained with public funds in almost all countries. The development of air transport all over the world would have been impossible without government subsidies. Reliable information about the amounts spent for all these purposes by the respective governments is not available since there exists in no country a careful study such as the publication by the U. S. Federal Coordinator of Transportation, "Public Aids to Transportation."[8]

Subsidies are usually balanced to some extent by taxation; highway users in particular pay their contribution for road construction and maintenance. Special taxes on transportation of passengers and freight seem not to be a very desirable method of taxation. In the United States such a tax had been introduced by the War Tax Law of 1917 as one of the measures "to defray war expenses." It was repealed by the Revenue Act of 1921. A new tax on transportation of passengers, introduced by the Revenue Act of 1941 (Sec. 3469) became effective October 10, 1941. Transport taxes are still being levied in various countries. In France and in Germany a transport tax had been imposed on railroad and water transportation only. It was recently extended to motor transportation (France, 1936; Germany, 1936). On the other hand, the tax in Germany on water transportation was abolished in 1936. In Great Britain a special transport tax, the railway passenger duty, applies to first and second class only. When the same transport tax is levied on

[4] Lack of discipline, excessively high wages, inadequate repairs and maintenance, and insufficient equipment are mentioned by the Secretary of Communications in his report of December 7, 1940, to the President as problems with which the Workers Administration was not able to cope. A similar development took place in Yucatan where the United Railways, which had been operated by the employees' union for several years, were recently taken back by the Government. Cf. *Railway Age*, New York, December 28, 1940, p. 996; January 11, 1941, p. 148; February 8, 1941, p. 291.

[5] Karl Ottmann, *Das oeffentliche Eisenbahnrecht Frankreichs*, Archiv fuer Eisenbahnwesen, Berlin, 1925, p. 561 et seq.

[6] Lyon, Leverett S., and Abramson, Victor, *Government and Economic Life*, Washington, 1940, p. 763 et seq.

[7] The Railways (Agreement) Act of 1935 has provided government guarantees for railroad borrowing up to 27 millions in order to enable the railroads to finance new works at low interest rates; cf. K. C. Fenelon, *British Railways Today*, London, 1939. Similar provisions had been introduced through the Development (Loan Guarantees and Grants) Act of 1929; cf. also the chapter on "Railroad Charges" for tax fund for rate rebates.

[8] Four volumes, Washington, 1940.

different modes of transportation, it can be considered as a factor in equalizing the costs of the respective services.

Men and women engaged in transportation represent a huge sector of the labor force. In America and Europe operating men, increasingly guarded by safety regulations, appear much alike in reliability and cool awareness of their responsible functions. The protection of labor by public action has made great progress. A comparative study of the existing conditions would reveal interesting similarities.

Government Agencies

Public action is initiated by parliaments and Government departments. In the United States various Government agencies, such as the Interstate Commerce Commission, the United States Maritime Commission, and the Civil Aeronautics Board, all quasi-judicial bodies, deal with transportation, as does the Public Roads Administration. Several departments have transportation divisions but there was no central Government agency in charge of coordinating transportation matters until recently when the Office of Defense Transportation was established. Abroad, under different forms of government, central departments to deal with the problems of more than one mode of transportation came into existence.[9] In Great Britain the Ministry of Transport, created in 1919, was first in charge for the most part of railway matters but has acquired increasing power over motor transportation. In France the Ministry of Public Works, which has existed for more than 100 years, handles matters of rail, water, and road transportation. In Germany the Reich's Ministry of Transport, created in 1920 after the Reich had taken over railroads and waterways from the State, is in charge of rail, waterway, and highway transportation. Air transportation, which had previously been under this agency was in 1933 transferred to a special Ministry of Aviation in charge of civil and military flying. In Italy, the Ministry of Communications is responsible for railroads, highways, and the merchant marine (post and telegraph are also under this ministry). In Canada, a Ministry of Transport was formed in 1936 to coordinate all modes of transportation. Concentrating matters of different modes of transportation in one departmental agency has proved to be of great help when attempting to shape a national transportation policy.[10]

For purposes of regulation quasi-judicial bodies are functioning in some countries. In Great Britain the Railway Rates Tribunal, in existence since the Railways Act of 1920, has exercised regulatory powers over railroads, and since 1933 over the London Passenger Transport Board. In Canada under the Transport Act of 1938 the Board of Transport Commissioners (known from 1904 to 1938 as the Board of Railway Commissioners) regulates rail, water, and air (but not highway) transportation. It is obvious that in these countries the initiative in welding the transportation sysytem together rests with a Government department which can move with more flexibility than quasi-judicial agencies.

In Great Britain, France, and Germany transport advisory councils represent the shipper and carrier interests. At first glance they seem to be great transportation assemblies, from which not much constructive activity might be expected. But, particularly in Great Britain, smaller committees of the Transport Advisory Council have succeeded in bringing representatives of all modes of transportation to the conference table where mutual agreements were reached on common problems.

Railroad Charges

Rates and fares have played the most important role in problems of public action for a long time. Countries where railroads are not operated by Government departments agree that regulation of railroad charges cannot be dispensed with. In 1938 the British railroads started the "Square Deal Campaign" to obtain freedom in rate making. Their efforts have not as yet met with success. Public action dealing with rates and fares has to reconcile the carrier interest in obtaining sufficient revenues with what is termed in the language of the American laws as "public interest." No generally acknowledged line of demarcation exists abroad between carrier and public interest. Opinion also differs as to what is to be considered the public interest and what action should be taken to protect it.

The general level of rates is determined in the rate-making rules of different countries by standards indicating which items of the expense accounts should be covered by revenues. There is a marked difference between standards which include operating expenses and fixed charges only, and those which allow for profits. The American Transportation Act of 1920 provided that the carriers should earn a fair return upon the value of the property, the fair return being determined in 1922 by the Interstate Commerce Commission at

[9] Witte, Bernard, *Eisenbahn and Staat*, Jena, 1932.

[10] In countries where no such central government agency functions, changes are now being considered. This is the case, for instance, in the Union of South Africa, where the Minister of Railways and Harbours is in charge of railways, ocean transportation, and airways, whereas highway matters are under the Minister of the Interior. The creation of a Ministry of Transport in charge of all modes of transportation is advocated by the General Manager of Railways and Harbours; cf. his reports for the years ended March 31, 1939 (pp. 65, 81) and 1940 (pp. 60, 78), Pretoria.

5¾ percent. It might be noted that this provision of the Act did not relate to individual carriers. It related to an average return upon the aggregate value of the railroad properties and permitted the strong roads to earn much more than 5¾ percent. This provision was repealed by the Emergency Transportation Act of 1933 which prescribed that, as one of the factors in rate making, due consideration should be given to the needs of revenues sufficient to enable the carriers to provide adequate and efficient service. This rule was not changed by the Transportation Act of 1940.

The British Railways Act of 1921 [11] has prescribed as the basis for rate making the "standard revenue," that is, the net revenue obtained in 1913 plus 5 percent of the capital expenditures incurred since that year. Because (contrary to the American method) in Great Britain a greater proportion of the capital expenditures of the railroads is financed by share capital than by borrowing, liberal allowance for dividends is included in this "standard revenue." These provisions became effective January 1, 1928. Considerations as to means of obtaining the standard revenue entered British rate-regulation policies to a considerable extent. In no year after 1927, however, was the standard revenue earned in full, a situation similar to that in America where a "fair return" was not obtained even in most of the years from 1920–29 and where the returns after 1929 were much smaller.

In France,[12] as has already been mentioned, the private companies have been treated as concessionaires of the railroads, the construction of which had been financed partly by the state and partly by the companies—a form of organization under which a clearcut division of responsibilities never was achieved. The Government had assumed not only extensive regulatory power over all spheres of carrier activities, but, feeling responsible for the accounts of the companies, had also undertaken to guarantee interest and a certain amount of dividends from the early days of railroad history. The convention of 1921 created a common fund, both for the state and the private railroads, into which surplus receipts had to be paid by successful roads and out of which deficits of others could be covered. Dividends, as guaranteed earlier, had to be paid out of the fund. Higher dividends were made possible through a system of bonuses for companies showing good operating results. Deficits of the fund had to be met by government advances. The fund was to be kept in balance through the adjustment of rates ("équilibre automatique par le jeu des tarifs"). In the period following this arrangement the instability of the currency frequently required such adjustments. The political forces, however, resented the unpopularity of rate increases so much that for considerable periods one cabinet after another failed to give the railroads the power to increase their rates sufficiently. Consequently, the financial returns of the railroads were unsatisfactory, and the burden upon the public finances increased from year to year. The legislation of August 31, 1937, creating the French National Railroad Co. has provided a new device for avoiding railroad deficits. When the budget for the ensuing year indicates that all necessary expenses will not be covered by estimated revenues under the existing tariffs, the company must propose an adequate rate adjustment. If the ministers of public works and of finance do not approve such changes, they must ask Parliament to appropriate the amount necessary to cover the deficit. If Parliament does not act upon this request, the rate adjustments become effective. This piece of legislation is evidence of a growing conviction that national railroad deficits cannot be tolerated; it is, however, realized that adjustment of rates is not always a proper tool for avoiding deficits, so an early decision to pay a certain subsidy is deemed preferable to the danger of being surprised by deficits at the end of the year.[13]

In Canada,[14] no reference is made in the existing laws to standards for rate making similar to those already discussed.

In Germany [15] the operation of railroads is considered more a public service than a business. In the German post-war literature,[16] it is emphasized that the main aim of a state-owned railroad system should be to provide adequate services for as low rates as possible. Rates should be fixed so that all operating expenses and fixed charges are covered but no emphasis is laid upon making profits. In keeping with these ideas, the German law of August 30, 1924, provided that the Ministry, in exercising its regulatory powers, should not prevent the railroad company from earning revenues necessary to cover operating expenses and fixed charges as well as statutory dividends upon

[11] Sherrington, C. E. R., *The Economics of Rail Transport in Great Britain*, London, vol. I, 1928, vol. II, 2d ed., 1937.

[12] Closset, M., "Le Nouveau Régime des Chemins de Fer Francais," *Révue Générale des Chemins de Fer*, Paris, 1937, 2 sem., p. 225 et seq. Dougall, Herbert E., "Railway rates, and Rate making in France since 1921," *Journal of Political Economy*, Chicago, Ill., 1933, p. 289 et seq. Godfornaux, R., *Apercus de l'Evolution des Chemins de Fer Francais*, Paris, 1928.

[13] This machinery was already functioning in 1938, when Parliament, instead of appropriating a subsidy to the railroad company, decreased the transport tax in order to avoid an increase in rates.

[14] Jackman, W. T., *Economic Principles of Transportation*, Toronto, 1935. Henry, R. A. C., "*Railroad Freight Rates in Canada*," 1939.

[15] Hellauer, Josef, *Gueterverkehr*, Jena, 1938.

[16] Cf., for instance, van der Leyen, A., "Eisenbahnen, Allgemeiner Teil," *Handwaerterbuch der Staatswissenschaften*, Jena, 1926, vol. 3, p. 577 et seq.

Dividends upon the common shares (which were preferred shares, which virtually were funded debts. owned by the government) were not mentioned in this connection. The German National Railroads never paid dividends upon the common shares but were able to meet the fixed charges and to pay dividends upon preferred shares.

Legal provisions fixing standards for rate making. such as those described, undoubtedly have their merits. In many cases, however, dire necessities have overruled the good intentions of the legislators.

The next question of general importance is the problem of the rate structure. The value-of-service principle has been the general basis for rate making as long as the railroads have tried to attract goods of high as well as of low value for haulage. As far as the rate structure is concerned, the meaning was almost the same when the veteran of modern transportation economists, the late Sir William Acworth,[17] wrote of "charging what the traffic will bear," and when German officials and scholars advocated a rate structure based on the interests of the economic life of the country ("gemeinwirtschaftliches Tarifsystem"). No attempt will be made to analyze the merits of this controversial issue at any length beyond the simple statement that, according to the conviction prevailing in many countries, cheap transportation of raw materials, such as coal, ore, and farm products, should be facilitated by allowing higher charges for manufactured goods and other commodities of higher value.[18] This general statement is, of course, subject to many qualifications. In the United States the costs of transporting raw materials which load heavily and move in bulk, are in many cases comparatively low. Consequently, low rates for such commodities are often remunerative. This is not equally true, however, in most countries where facilities and equipment are not so highly developed for moving large quantities of goods over long distances.

The issue of the value-rate structure had a great bearing on rate policies when railroads had a quasi-monopoly; it is even more important in solving the problems of regulating competing agencies, as will be discussed later. At this point it should only be mentioned that the value-rates structure and its preservation has played and still plays an important role in rate policies in Great Britain, France, Germany, and Canada. It is the general basis for the classification of commodities and the fixing of rates for individual classes in these countries. In numerous cases, however, other principles, in particular the necessity of coping with the competition of water and motor transportation, are governing the fixing of individual rates.

Personal discrimination is unlawful in the United States, and up to recent years this was true in all other countries. The greatest deviation from the principle that personal discrimination should be avoided is the British system of "agreed charges"[19] which was authorized by the Road and Rail Traffic Act of 1933. Agreed charges are not permitted when the traffic involved can be secured for rail transportation by offering commodity rates. These charges have to be established by agreement between the carrier and an individual shipper. The agreement includes the provision that all of the shippers' goods must be shipped by rail, with minor exceptions specified. No rule is given by law for fixing the rates. The usual method is that the total freight charges which have been paid for the rail and road traffic of the shipper in a representative previous period are used as basis for computing an average rate for a weight or other unit (e. g., number of packages). This average rate or a slightly reduced amount is applied to the same units of future traffic irrespective of the kind of commodities and of the length of haulage, the extreme case being that of a chain store, where the charge is determined by a percentage of the purchase price of all goods handled by the store. Agreed charges have to be approved by the Railway Rates Tribunal. Shippers operating under the same or similar circumstances as the partner in a rate agreement may apply for analogous charges to the Railway Rates Tribunal. These legal provisions for agreed charges apply to railroads only, since the freight rates of other modes of transportation are not being regulated.[20]

In Canada agreed charges have been permitted for rail, water, and air carriers by the Transportation Act of 1938. The British example has influenced this legislation, but the deviations from the acknowledged principles of rate making have not been so far-reaching. Differing from the British method, agreed rates in all cases must be expressed in cents per weight unit, trainload rates being forbidden. Agreed rates between points served by competing rail carriers are unlawful unless all these carriers join in the agreement. In France also,[21] the charter for the newly created French

[17] Acworth, Sir William M., *The Elements of Railway Economics*, New Edition, Oxford, 1924, p. 83 et seq.

[18] Cf. Conference Report on the Transportation Act of 1940, April 26, 1940, 76th Cong., 3d sess., Rept. No. 2016, p. 81.

[19] Cf. Sherrington, C. E. R., *Transport Conditions in Great Britain and the Railway's Campaign for a "Square Deal."* Address to the 49th Annual Meeting of the Railway Accounting Officers. Fifty-third Report of the Railway Accounting Officers, Association of American Railroads, p. 61 et seq.

[20] In 1939 over 850 agreed charges were in operation, representing over 4 million pounds revenue. They are used for higher class traffic only. *Railway Gazette*, London, March 31, 1939.

[21] Aurenge, M., "Le Cahier des charges des lignes exploitée par la Société Nationale des Chemins de Fer Francais." *Rérue Générale des Chemins de Fer*, Paris, 1938, 1. sem., p. 269 et seq.

National Railroad Company has permitted agreed charges on freight traffic.

The system of agreed charges in Great Britain and in Canada can be considered as some kind of compensation granted to the railroads for not regulating motor carrier rates. In France, where motor-carrier rates are regulated, everything seems to have been done that could be of help to the railroads in distress.

In the United States, the level of rates, and to some extent the rate structure, differ in the various rate territories and areas, the spread in the rates for hauling the same commodity over the same distance being remarkably high.[22] The United States is so much bigger in area than any European country (except Russia) that in many instances comparisons must be made very carefully. It should be borne in mind, however, that each of the great European countries is by no means an area of equal economic development. But, except for commodity rates between specific places, the general level of rates, the classification and the ratings, are the same throughout the country in Great Britain, France, and Germany. Disadvantages of such a system were minimized, when, through amalgamation, railroads operating under less favorable conditions were absorbed by the great networks. Increasing the areas to be served under the same financial responsibility means increasing the areas where equality of rates can be justified.

Changes in rates are initiated usually by the carriers. Abroad, as in this country, the railroads offer many advantageous rates for certain parts of industry and agriculture or sell cheap tickets to tourists or commuters. Insofar as this is based on the voluntary decision of a privately owned railroad company, it is a matter of its business policy and not relevant to this discussion. Of interest, however, are actions initiated by governments in order to promote objectives of a national economic or social policy which lie outside the sphere of transportation. In the United States rate regulation as a rule is not exercised under these aspects. In other countries, many examples of such policies have been in evidence. As far as the general level of rates was concerned, examples of Government action of this kind are not numerous. In Germany, at the end of 1931, the Government initiated measures in all sectors of German economy to reduce the general level of prices. The National Railroad Co., while suffering heavily from the depression, was called upon to follow this lead and to decrease its general rate level considerably. The company, although still autonomous, did not feel strong enough in this period to refuse the demand, though no hope could be entertained that even a part of the resulting losses in revenues would be balanced by an increase in traffic. This case, although an exception in German transportation history, shows the dangers involved in such policies for sound conduct of railroad finances. It may be noted that at the same time the Interstate Commerce Commission in the United States authorized the railroads to increase the rate level through the so-called "emergency charges." [23]

Many more examples of public action which were designed to promote special areas, special industries, export and import, and agricultural production could be enumerated. Such efforts in some cases concerned the classification of commodities, but for the most part they were directed toward commodity rates.

In Great Britain the regulatory agency, the Railway Rates Tribunal, has not felt empowered to enforce changes in rates to promote such objectives. The Government, however, in order to foster cheaper transportation, offered special compensation for this purpose. By the Local Government Act of 1929, a system of rebates has been introduced for shipments of agricultural products, coal, and coke for export and for domestic iron and steel works, raw material for such works, and mine timber. These rebates were paid from a fund into which a certain proportion of local taxes levied from the railroads was paid.

In Canada Parliament took the initiative in rate policies on several occasions. The Maritime Freight Rates Act of 1927 provided for rate reductions for the Maritime Provinces. Not only the Canadian National Railways, which were involved primarily, but the private railroad companies as well were awarded special compensations for losses in revenues incurred because of these rate reductions. When in 1897 the Dominion Government had granted over 3 million dollars to the Canadian Pacific Railways for building a new line through the Crow's Nest Pass, an agreement on rate reductions in favor of the shippers of Western Canada had been reached with this company. In 1925 an act of Parliament amending the Railway Act of 1919 ordered that the low "Crow's Nest Pass" rates should apply to all grain and flour shipments eastbound to Lake Superior. No current compensation was offered in this case, and the subsidy given in 1897 can hardly be considered as compensation for rate reductions prescribed in 1925. In the following years reduced export rates on grain and flour were also fixed by the Board of Railway Commissioners for shipments eastbound to Quebec and westbound to Vancouver.

[22] Cf. *Hearings on Omnibus Transportation Bill*, 76th Cong., 1st sess., vol. I, p. 811.

[23] The *Fifteen Percent Case*, 1931, 178 I. C. C. 539.

In Germany[24] during the period from 1924 to 1933 the railroad company published a series of new commodity rates which had ostensibly been initiated by the Government, designed to reduce prices of food, to aid industries in distressed areas, and to encourage export. From 1933 on, after the present regime had come into power, a great number of new commodity rates were established in order to promote all kinds of governmental objectives. Among these were production of substitutes (synthetic rubber, artificial wool, synthetic oil, and potatoes for use in breadstuffs), use of low-grade ores for steel production, of fertilizers in agriculture, building of new settlements for workers, aid for distressed areas (border districts, flooded areas), and construction of forums and buildings for party rallies. Special export rates and other commodity rates which facilitated competition with trade routes outside of Germany were designed to assist the foreign trade policy of the Government. These freight-rate reductions have their counterpart in an increasing number of special passenger fares introduced to aid the social and racial goal of the Government. In 1938, 73 percent of all revenue passengers traveled at reduced fares.[25] This great number of rate and fare reductions implied sacrifices on the part of the railroads which they could bear without difficulties, however, since the industrial recovery had considerably improved their financial status.

This discussion shows that there are ample opportunities for using transportation charges as an efficient instrument of promoting national and social objectives. Whether such tools should be utilized in a democracy appears to be an issue of fundamental importance. Another matter for further consideration would be to what extent privately owned transportation agencies should be protected against losses resulting from such methods of public action.

[24] Reports of the German National Railroads (*Geschaeftesberichte der Deutschen Reichsbahn* [Gesellschaft]).

[25] The following items taken from a full list of special fares, published in the 1937 Report of the National Railroads, may be of interest for different reasons, the figures indicating the percentage of reduction: 20–43 percent, vacation tickets; 25 percent, round-trip tickets; 33⅓ percent, week end tickets (including tickets for holidays and Wednesdays); tourists (9–29 persons); foreign visitors of fairs; 40 percent, vacation trains; 40–49 percent, round trips to East Prussia; 50 percent, children (4–10 years); families with more than 4 children; tourist parties (over 29 persons); sportsmen traveling to games; personnel of societies aiding ill persons and unfortunate girls; ill persons; blind persons; veterans; disabled veterans of war and invalids of the national-socialist revolution; student tickets; workmen tickets; SA men (brown-shirts); special tourist trains (at least 300 persons); 60 percent, foreigners and Germans living abroad; special tourist trains (at least 600 persons); vacation trains to East Prussia; 62–65 percent, military personnel; SS men (black shirts); compulsory work service; 62–82 percent, workmen weekly tickets; 75 percent, special trains for the National Socialist party organization "Strength through Joy," and to rallies of the National Socialist party; 100 percent, persons accompanying disabled war veterans and invalids of the National Socialist revolution.

The Relationship Between the Different Modes of Transportation

Development of New Facilities

As in the United States during the period following the World War, a remarkable development of new transportation facilities has taken place abroad. In Middle and Western Europe, most of the capital expenditures for railroads were devoted to improvement and modernization of existing lines. The tendency toward increasing speed of operation resulted in continuous efforts to provide for efficient equipment and for heavier and better rails. Automatic air brakes on freight cars, which had been in common use in the United States a long time before the World War, were not used in Europe at all before the 1920's. At this time, the European countries started programs for equipping locomotives and freight cars with such devices. Automatic couplers are still not used there, except for specific purposes (e. g., suburban trains). The efforts sponsored by the League of Nations to develop an international finance and construction program for automatic couplers were unsuccessful. In North and Middle Europe and in Italy electrification of of railroad lines has made great progress. In Russia,[26] entirely new rail lines have been built by the Government on a large scale in connection with industrial expansion programs. Table 1 shows the development of the length of line and of the traffic as reported from Russian sources. The increase in freight traffic seems to be considerably higher than could be reasonably expected.

TABLE 1.—*Railroad Operations in Russia, 1913 and 1938*

	1913	1938	Percent increase, 1913–38
Miles operated	36,888	52,865	146
Passengers carried ... millions	185	1,178	637
Passenger-miles ... do	15,671	59,000	377
Freight ... millions of tons	132	516.3	391
Freight ... millions of ton-miles	40,830	208,740	512

Source: Britannica Book of the Year, 1941, p. 687; cf. also *Modern Transport*, London, March 23, 1940, p. 7; U. S. Department of Commerce, *Foreign Railway News*, March 23, 1940, p. 7.

NOTE.—No responsibility can be assumed for the accuracy of these figures.

In Canada, railroad construction during this period, except for completion of the lines to the Hudson and James Bays, was mostly confined to the building of new branch lines.

The rise of motor transportation, which has been the outstanding event in American transportation history

[26] Tverskoy, K. N., *The Unified Transport System of the U. S. S. R.*, London, 1936; "Transport in Soviet Russia," *Modern Transport*, London, 1940, March 23, p. 7 et seq., May 4, p. 11 et seq., June 1, p. 7 et seq.

in the post-war period, was not so turbulent in other countries. Table 2 shows a comparison of the figures involved.

TABLE 2.—*Motor Vehicle Registrations in Leading Countries for Selected Years*

[Number of vehicles in thousands]

	U. S. A.	Canada	Great Britain	France	Germany
PASSENGER VEHICLES					
Private cars:					
1926	17,465	645	661	450	215
1938	25,151	1,156	1,846	1,745	1,416
Buses:					
1926	58	2	18	35	5
1938	132	2	86	39	13
Total:					
1923	10,794	473	353	201	83
1926	17,522	647	679	485	220
1938	25,283	1,158	1,932	1,780	1,429
TRUCKS					
1923	1,445	36	145	95	46
1926	2,432	73	224	250	107
1938	4,202	217	490	468	388
TOTAL MOTOR VEHICLE REGISTRATIONS					
1919	7,559	337	255	202	75
1923	12,239	509	498	296	129
1926	19,954	720	903	735	327
1938	29,486	1,375	2,423	2,251	1,816
POPULATION PER VEHICLE					
1919	14	21	180	198	866
1923	9	17	88	133	411
1926	6	12	49	54	194
1938	4	8	19	18	42

Source: Automobile Manufacturers Association, *Automobile Facts and Figures*. Washington, D. C.

For the years prior to 1923, only figures for total registrations are available, and, for the years prior to 1926, no figures for busses are available.

Nevertheless, in Europe and in Canada the increasing needs of motor transportation also made large road-building programs unavoidable. Federal, State, and local Governments have spent large amounts for the construction and improvement of highways. In Europe, highways restricted to motor traffic only were built first in Italy, partly as private undertakings and as toll roads. In Germany the construction of the Reichsautobahnen started after the present regime came into power.[27] The tendency to foster motor transportation generally and to provide jobs was the leading idea, rather than military reasons, when a public corporation was chartered for this purpose in 1933 as a subsidiary of the German National Railroads. The railroads offered considerable personnel and financial assistance, but were not able to exert much influence upon the policies adopted. In 1939 the ties between the National Railroads and the Reichsautobahnen were severed almost entirely. The Reichsautobahnen were planned as a country-wide system of superhighways connecting all important cities, the total program including 4,300 miles. This program was extended, particularly after Germany acquired Austria and parts of Poland. At the end of 1938 almost 2,000 miles had been completed and 600 miles were under construction. Tolls are not levied on these roads.

Experience gained during the World War gave European governments incentive for new works on waterways. Many schemes have been developed for improving the main rivers and the existing canals as well as for constructing canals. Achievements in river improvements have been numerous. The most important new canals which were completed by the respective governments in this period were: in the Netherlands, the Juliana Canal (Zutphen to Enshede); in Belgium, the Albert Canal (Liege to Antwerp); and in Germany, the Mittelland Canal (Hannover to Magdeburg), which links the Western and Eastern German river systems. Other projects are under construction. In Russia, large river improvements and new canals, connecting the river systems of the White, the Baltic, the Black, the Azov, and the Caspian Seas, are completed or under construction by the government. In Canada, the Welland Ship Canal (connecting Lake Erie and Lake Ontario) was completed.

Air transportation will be mentioned only briefly. In Europe and in Canada an increasing network of airways has been developed. The most spectacular success has been the system of scheduled flights between Great Britain and her dominions and colonies overseas.

Pipe lines of any great length are not in operation in Europe or Canada. Of high commerical value, and at the present time of great political importance, are the oil pipe-line system in Rumania, the pipe lines between Baku and Batum, Russia (Black Sea), and the two lines from Iraq to Syria and to Palestine (Mediterranean).

This short résumé of development of additional facilities in so many fields gives rise to the question as to whether these activities were based on thorough planning following studies of the potentialities of the existing transportation systems and of future economic and social traffic needs in larger areas. Such work is in progress in some places,[28] but the complaints about

[27] Volk, Franz, *Der Aufbau der Gesellschaft Reichsautobahnen*, Leipzig, 1935.

[28] In Germany, for instance, a Government agency, "Reichsstelle für Raumordnung," is in charge of such studies in cooperation with transportation authorities and agencies. Cf. Raumforschung and Raumordnung. Special issue, *Verkehr and Raumordnung*, Berlin, 1939, No. 4/5, p. 149 et seq.

overdevelopment of traffic facilities which could be heard in many countries indicate that much remains to be done in coordinated efforts toward efficient planning.

Competition and Coordination

The increase of facilities and equipment abroad created new issues [29] which were similar in essence, although in many cases different in scope, to those confronting the United States in the recent period.

In the thirties, railroads were suffering not only from the world-wide depression, but also from losses in traffic which new competitors gained. Traffic conditions differed considerably, however, in different countries. Table 3 shows freight-traffic trends of various railroad systems as compared with that of class I railroads in the United States.

TABLE 3.—*Index Numbers of Freight Traffic Trends, 1930 to 1939*

[Freight ton-miles in 1929=100]

National railroad systems	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
UNITED STATES OF AMERICA										
Class I railroads	86	69	52	56	60	63	76	81	65	74
CANADA										
Canadian National Railways	83	74	65	58	65	68	75	76	73	86
Canadian Pacific Railways	83	74	69	54	69	72	78	80	83	96
GREAT BRITAIN										
London Midland & Scottish Railway	94	86	80	80	86	88	94	99	89	....
Southern Railway	99	98	93	92	96	95	95	97	90	....
Great Western Railway	94	84	78	80	86	88	92	100	90	....
FRANCE										
Société Nat. des Chemins de Fer [1]	98	89	76	74	71	65	71	76	64	....
GERMANY										
German Nat. Railroads	80	67	58	63	75	83	93	104	[2] 123	....

Sources: Interstate Commerce Commission Reports on the Statistics of Railways in the United States, Washington, D. C. Bulletin de l'Union Internationale des Chemins de Fer, Paris, April-May 1939. Reports of the Canadian National and Canadian Pacific Railways.

[1] 1930-37, the 7 great systems.
[2] Includes Sudetenland.

As these figures reveal, the changes in volume of traffic in Great Britain were comparatively moderate. American and German figures indicate almost the same losses after 1930. German traffic recovered in recent years during the rearmament and government-spending period. In France, the greatest decline occurred later than in America and Germany, but almost no upward trend is recorded since then.

These changes in railroad traffic with the resulting losses in revenues more than anything else drew the attention of many governments to the growing competition of the different modes of transportation.

Road and Rail

Licensing.—The most urgent problems [30] have been presented by road and rail competition.[31] The increasing traffic handled by private car and private truck made successful government interference particularly difficult. In most countries no decisive steps have been taken to regulate private carriers effectively other than to provide for safety of operations. In France private carriers of property were forbidden to carry return loads for compensation. When operating over a certain distance, they had to pay the same transport tax as commercial carriers, and private vehicles weighing over 12 metric tons had to be licensed. Licenses for new vehicles were issued only when no public road or rail services were available. In Great Britain private carriers of property must obtain a license ("C" license for "ancillary users"), but this license is issued when the safety requirements have been met without examination as to whether any traffic demand for such service exists. The most far-reaching restrictions of private carriers exist in two of the British dominions, viz; South Africa and Western Australia. In both countries, as in the other Australian States, transportation policies were directed toward protection of the government-owned railroads. In the two countries mentioned, private operators carrying their own goods in

[29] The special problems of taxation, safety, and other police matters, as well as those of the protection of labor, are beyond the scope of this discussion.

[30] Mance, Sir H. Osborne, *The Road and Rail Transport Problem*, London, 1940; Long, W. Rodney, *Transport Control Abroad*, U. S. Department of Commerce, Trade Promotion Series, No. 196, Washington, D. C., 1939; Wohl, Paul, and Albitreccia, A., *Road and Rail in Forty Countries*, London, 1935; Chester, D. N., *Public Control of Road Passenger Transport*, Manchester, 1936; Delanney, L., *Goods Transport by Rail and Road, Rates and Regulations in France, Modern Transport*, London, 1939, October 7, p. 5; Aitchison, Clyde B., *State Control of Transport Services and Rates in Great Britain*, The Annals of the American Academy of Political and Social Science, Philadelphia, January 1939, p. 185 et seq.; Walker, Gilbert, *Road and Rail—A Study of the Competition of Two Industries; Der Stand der Gleichordnung von Eisenbahn-und Strassenverker in Frankreich.* Von einem Französischen Eisenbahnfachmann, Archiv für Eisenbahnwesen, Berlin, 1939, u. 395 et seq. Hellauer, Josef, op. cit.

[31] Most important legislation on motor-carrier regulation:

Great Britain.—Road Traffic Act of 1930 (Passenger), Road and Rail Traffic Act of 1933 (Freight), Road Traffic Act of 1934, Road Traffic Act of 1937; Regulations of 1935, 1936, 1937; Road Haulage Wages Act of 1938 (Labor).

France.—A series of decree-laws were issued since 1934. The decree-law of November 12, 1938, and the decree of January 12, 1939, finally codified and amended all previous legislation.

Germany.—Licensing was introduced by the emergency decree of October 6, 1931. Further legislation—passenger: law of December 4, 1934, decree of March 26, 1935, law of December 6, 1937; freight: law of June 26, 1935, decree of March 27, 1936, Reichskraftwagentarif of March 30, 1936, decree of February 2, 1938.

Union of South Africa.—Motor Carrier Transportation Act of 1930, amended 1932, 1934, 1937.

Australia.—Legislation was enacted in New South Wales 1930, 1931, 1932; in Queensland 1932, 1938; in South Australia 1930, 1931, 1932, 1933, 1934, 1936; in Tasmania 1930, 1933, 1935, 1936, 1938, 1939; in Victoria 1932, 1933, 1935; and in Western Australia 1933, 1938.

the course of commercial activities, are treated like commercial carriers and are subject to the same strict licensing requirements which make competition with railroad or highways services operated by the railroads almost impossible. Exempted from these restrictions, among other operators of minor importance, are owners of farm trucks who are permitted to carry their own farm products to markets, mills, railroad stations, and to transport goods of any kind for their own use as return loads.[32]

As far as commercial carriers are concerned, similar methods are in use abroad as are provided for in the American Motor Carrier Act of 1935 which has required application for certificates of public convenience and necessity for common carriers and of permits for contract-carriers. "Licensing" will be used as the term for procedures of this kind. When certain types of commercial operators, while applying for licenses, must prove that the traffic demand requires their services, licensing is used as a tool for limiting the motor carrier business. In Great Britain, licenses are required in the case of commercial carriers of passengers and property. Carriers of property which undertake for-hire business only must apply for "A" licenses as "public haulers." Carriers which do partly commercial and partly private business apply for "B" licenses ("limited carriers"). Different from American methods, licenses are granted for a limited period only; they indicate the number of vehicles permitted for use, and new licenses are required for additional vehicles. In charge of licensing are regional Traffic Commissioners (Licensing Authorities). In France, also, licensing was required for commercial carriers in the passenger and freight service and the same was true in Germany where the rules were particularly strict. From 1933 to 1938 the issuance of new licenses was discontinued entirely. The imminent war and the consequent need for trucks on a large scale when the West wall was being built necessarily changed this policy.

Licenses for commercial carriers competing with railroad services are not issued at all in Western Australia, and only a few exceptions from this rule are permitted. In the other Australian States and in South Africa[33] licensing is used to a great extent to protect the government-owned railroads. This is achieved in New South Wales, South Australia, and Tasmania by levying special charges as license fees. The charges consist of a percentage of the revenues in Tasmania, of a lump sum or a percentage of the gross earnings in South Australia and of a comparatively high fixed amount per traffic unit in New South Wales. If a license is granted at all for traffic competitive with railroad services the charges are usually higher than those for noncompetitive traffic. It is of interest that in Australia a court review found that the imposing of charges of this kind on interstate traffic by the State of New South Wales was unconstitutional. Victoria seems to be the only Australian State where motor transportation is treated somewhat liberally and where a "grandfather clause" protects carriers which had operated during a certain period before the enactment of the licensing regulation.[34] The significance of different treatment of long and short-distance traffic in most of the countries mentioned will be discussed later.

In Canada no action was taken on a bill introduced in Parliament by the Ministry of Transport which would have provided for licensing and other Federal regulation of highway transportation, nor has there been much progress reported, of closer cooperation in this field by the Provincial Governments.[35]

Coordination.—Many attempts have been made to bring the conflicting carrier interests into closer relationship. In Germany the project was under consideration for years to grant the railroads a monopoly for long-distance trucking. This plan was finally rejected.

In Eire the Road Transport Act of 1932 and 1933 required licenses for commercial motor carriers of passenger and freight. By the Act of 1933 the railroads were encouraged to engage in motor-passenger and freight services. They were given unrestricted licenses for these services and were empowered to take over any passenger or freight license from other commercial carriers upon payment of compensation. Failing agreement, there should be arbitration. Following this legislation the railroads obtained almost a complete monopoly of highway passenger services. They also took over a great proportion of the trucking business but they were not able to acquire all of the business and, being limited in their rate making by regulation, they could not cope with the competition of the remaining independent truckers whose rates were not regulated

[32] The Commissioner of Railways of Western Australia complains that the provisions for limiting return loads are often not adhered to and recommends new legislation. Cf. Western Australia. Report of the Government Railways * * * for the years ended June 30, 1939 (p. 11) and June 30, 1940 (p. 10).

[33] Special methods employed by the South African Railroads to promote rail transportation include the "transport reciprocity clause" in railway tenders, which means that bids for railroad materials and supplies can only be submitted by contractors who undertake the liability of using rail or road services operated by the railroads exclusively for transportation of all their goods. A contract stipulating the same liability is required from importers who want to avoid increased wharfage charges at the harbors operated by the railroads.

[34] Many complaints about this policy are voiced in the reports of the Victorian Railway Commissioners. Cf. Report for the years ended June 30, 1939 (p. 43) and 1940 (p. 10), Melbourne.

[35] *Report of the Royal Commission on Dominion-Provincial Relations*, 1940, ("Sirvis Commission") Book 2, p. 187 et seq. Cf. for provincial motor vehicle and traffic regulations, and for the influence of the unregulated motor competition upon the railroad rates structure: *Canada Year Book 1940*, Ottawa, 1941, p. 568 et seq.

and of the private carriers. The railroads, which had paid considerable amounts acquiring licenses, suffered great losses. Investigations are underway preparatory to introducing new legislation.

In Northern Ireland the exclusive power of operating busses and trucks for hire, including pick-up and delivery services to railroad stations, was vested in a public corporation, the Road Transport Board, under the Road and Rail Transport Act of 1935. A pool of net receipts was to be formed with the railroads, so that the road and rail operating agencies had a common financial interest. This scheme was not successful. The Road Board operated at a deficit, the railroads which had lost their road transport business were not satisfied, and the use of private trucks increased. Studies were being made before the outbreak of the war for preparing new legislation. Both the schemes of Eire and that of Northern Ireland were doomed to failure, owing mainly to the particular circumstances prevailing in these areas. Therefore they offer only a slight basis for final judgment as to whether it would be possible under more favorable conditions to overcome the fundamental difficulties of any monopoly or quasi monopoly of this kind.

A quasi monopoly of road and rail transportation was in operation in Rumania for some time. In 1934 the "Autonomous Railroad Administration" was given the exclusive right to operate passenger and freight services over a limited number of highways parallel to the rail lines. Under these provisions the railroads operated some bus lines and a small number of trucks. The motor carriers complained about the restriction of their activities, and the shippers were not satisfied with the freight services offered. In 1938 the highway mileage over which the railroads had a monopoly was reduced. In 1939 the monopoly was abolished because it was felt that the existing number of highway vehicles did not constitute a serious threat to the railroads, and the restrictions on highway transportation were not in the public interest. This Rumanian example is mentioned because it seems to be a typical case. Truck operation by railroads can be a useful instrument for improving the service when a well-devised plan of supplementing rail services through road operations is carried out. There is, however, a great temptation for railroad management to use monopolistic rights to oppress road services more or less entirely. The result is a handicap to the sound development of motor transportation in the country involved.

An often-cited example of coordination of road, rail, and river transport is the organization of the London Passenger Transport Board. Since this discussion is concerned particularly with intercity transportation, the achievements of the Board can be mentioned only briefly. Under the London Passenger Transport Act of 1933, as amended in later years, the Board operates all subways, streetcars, busses, and passenger steamers in the London urban and suburban area. It also has operating and pooling agreements with the four railroad companies for the operation of their suburban lines. The Board has worked very satisfactorily as can be judged by its financial returns and its high reputation which is evident from many comments in English publications. It must be remembered, however, that its activities are limited to passenger services.

Many more examples seem to indicate that it is easier to bring competitors together in passenger transportation than in freight business. This is, in particular, true in cases where the railroads have been able to acquire financial interests in existing or new bus lines. American railroad companies made considerable investments in bus companies. The same took place in Great Britain where, under the Road Transport Acts of 1928, the railroads were empowered to enter the motor transportation field by running their own busses and trucks or by acquiring interests in motor transportation companies. As far as passenger services were concerned, British railroads made ample use of these possibilities. The carriers as well as the general public felt satisfied with the results.

Trucking has also been undertaken by the British railroads not only in the pick-up and delivery service but over long distances as well. These attempts, however, were not large in scope and proved to be of little value for solving the rail and road problems. The same has been true in Germany. The National Railroads with the consent of the government have operated a limited number of trucks in local and long distance traffic. More interesting is their cooperation with forwarding agencies, one of them a subsidiary, in improving less-than-carload services and holding down the cost of cartage. They also have started bus services on a small scale, in particular, express lines over the superhighways. However, neither in Great Britain nor in Germany does the volume of motor services operated by the railroads represent any considerable proportion of the total traffic moving over highways. A different situation exists in South Africa. There the government-owned railroads engage in truck transportation coordinated with their rail services on an increasing scale and carry a great proportion of the motor freight traffic of the country. Since these activities, as mentioned above, are protected against competition by commercial and to some extent by private carriers the operating results for the railroads are satisfactory.[36]

[36] In France rail carriers were not encouraged by the Government to operate road services.

Special methods for division of function.—As far as passenger service is concerned another German Government agency, the Post Office Department, is engaged in road transportation. Even after the railroads were already operating the main arteries of the trade routes the Post Office Department of the German states continued to use their horse-drawn mail coaches for the service over feeder lines. It was a natural step for them to put motorbusses into service when this proved useful. The Post Office Department of the Reich, which took over the state systems in 1920, has adopted the same policy and has increased the passenger services considerably. Since, with few exceptions, no lines parallel to the railroads have been operated, conflicts about competitive traffic have been avoided. This example of the division of functions between government agencies is also an example of the division of traffic between rail and motor carriers. It fits in with the theory often advanced that short distance traffic and traffic of light density can be handled more economically by road than by rail. There is a difference of opinion, however, as to whether such a division of traffic should be favored by government action. In Great Britain strict licensing requirements, which include proof that the traffic demand necessitates the services in the public interest and that suitable traffic facilities are not already available, have applied equally to short- and long-haul commercial transportation (A and B licenses). In Germany long-distance carriers only have been subjected to strict licensing of this kind. In France, licensing requirements have been stricter for long-distance than for short-distance carriers. Furthermore, in both countries short-distance operators are not subject to regulation of rates, as will be explained later. Exemptions from strict licensing requirements for short-distance operators are also in evidence in South Africa and in the Australian states.

Somewhat different from these methods used to discourage long-distance motor traffic are those for dividing main and branch line traffic, or, in other words, traffic of high and low density. After the British Government had empowered the railroads to enter the bus business, they closed down rail passenger services on over 700 miles of branch lines, since the bus companies in which the railroads had financial interests furnished adequate services on these routes.[37] In France, under the legislation which has come into effect since 1934, agreements were required between railways and bus operators for exchange of passenger-miles in order to enable the railroads to close the passenger traffic on branch lines whereas the bus operators had to discontinue their services paralleling main rail lines. These agreements were parts of regional plans for coordination of services. Before the outbreak of the present war, 5,800 miles of railway were completely and 3,100 miles partly closed to passenger traffic, and the complete or partial closure of an additional 400 miles was under consideration. Bus services were introduced superseding the rail services. The far-reaching influence of these changes can be illustrated by the fact that the 9,300 miles involved represent 23 percent of the total French railway system. Considerable economies are reported as a result of these measures.

The French methods for division of freight traffic tended to limit the quantities hauled by trucks. Agreements about traffic quotas were required by law between road and rail operators. These quotas had to be based on the traffic of previous periods. Excess over quotas could be permitted upon payment of a toll to the railroads. No results could be gained from the working of these quota arrangements, since up to the outbreak of the present war, the agreements had not been completed. It is needless to say that such a scheme is particularly apt to help the railroads and to decrease road competition.

Regulation of Rates.—Bus fares are regulated in Great Britain, France, and Germany as well as in South Africa and in most of the Australian states. No issue of any importance came up in this field.

The problems concerning freight rates are much more complex. The main issues are whether motor-carrier rates should be regulated at all, whether such regulation, if any, should be used to restrict their activities in order to protect other carriers, and whether it should be a tool for preserving the value rate structure of the railroads, a question already discussed briefly. In the United States, motor-carrier rates are regulated but equality of rates is not prescribed by law nor aimed at by regulation. The objective of regulatory action is a proper balance between road and rail rates, whereby the cost of service plays an increasing role in cases decided recently. This American solution can be considered as a middle course between two extreme possibilities, represented on the one hand by the method in use in Great Britain—no regulation of motor-carrier rates—and on the other hand, by the method adopted in France and in Germany—enforced equality of road and rail rates.

In Great Britain, the freedom of motor carriers from rate regulation was the reason why the railroads in their "Square Deal" campaign, as already mentioned, demanded freedom in rate making for themselves. This was not granted, but the tendency expressed in the 1939 report of the Transport Advisory Council is

[37] Sherrington, C. E. R., *A Hundred Years of Inland Transport*, London, 1934, p. 343.

to encourage agreements on rates between the different carriers in cooperation with the shippers. It is suggested, but no legal action has been taken, that motor-carrier rates fixed by agreements should become enforceable by making such rates a part of the conditions of the licenses. The rate making of the railroads should become more flexible. The standard revenue should no longer be the basis for the rate level. The provisions against personal discrimination, and discrimination between places should be lessened if the rates as such are reasonable. These proposals assume, however, that the regulations of railroad rates by the Railway Rates Tribunal should be continued to some extent. Should these suggestions become the basis for new legislation the railroad operators would gain considerable discretionary power, but the road operators would lose a good deal of their present freedom. It can be assumed that road and rail rates fixed by such agreements would at least be similar. To what extent, however, the value rate structure would be preserved by such methods can hardly be predicted.

In France, agreements on freight rates to be reached by the different carriers in cooperation with the shippers were also prescribed by law. Motor-carrier rates had, as a matter of principle, to be equal to rail rates but a simpler classification was used. Special charges for pick-up and delivery had to be levied by motor carriers. It is reported, however, that the road and rail rates were not strictly equal for all commodities, goods of higher value being transported somewhat more cheaply by road than by rail.

The German legislation of 1935 has been stricter in flatly prescribing that carrier rates must be the same as rail rates. From 1936, when the first motor-carrier tariff was published, to 1938, the motor carriers were permitted to charge the higher class rates and a limited number of commodity rates only. This limitation was repealed in 1938; from then on all class rates and all commodity rates which were of interest to motor carriers were available to them. The previous requirement that motor carriers should levy special charges for pick-up and delivery was repealed also. Regulations such as those enacted in France and in Germany involve great limitations on motor carriers. It is not astonishing that in Germany at least they were dissatisfied with this solution.[38] Rate regulation is also in force in South Africa and in some of the Australian states. Equality of rail and motor-carrier rates is not prescribed by law in these countries.

Where distribution of functions between rail and road operators had to become a part of a national transportation policy, nothing could be achieved by a policy of laissez-faire. Little evidence exists as yet of successful operation of transportation monopolies, so the last resort has been limitations imposed in one way or another on the carriers in spite of the undesirable effect of such a policy upon technical progress and enterprise in the industries involved. This is the not very encouraging result of all the methods studied and put into effect in other countries.

Organization of the Motor Carrier Industry

The French and German[39] governments created strong organizations of the commercial carriers of property and used them for enforcement of the regulations. In Germany, membership in the organization is compulsory; in France, it was not compulsory in a formal sense, but commercial operators who were not members are subject to special supervision by government inspectors and are subject to a transport tax twice as high as that of members. In both countries, the organizations were made responsible for their members abiding by the tariffs and other rules. In Germany, the organization operates distributing centers for freight traffic which in emergencies may prove an expedient instrument for influencing the handling of traffic.

Water

Water carriers,[40] for a long time the only competitors of the railroads, have for the most part been protected rather than limited by public action. Abroad, governments, as a rule, have paid little attention to studies made by scholars about the cost to the community of water transportation, all-inclusive costs being considered.

Tolls on public waterways, if levied at all, have mostly been confined to canals, usually as more or less nominal charges. British canals, unlike those in other European countries and in Canada, have been built and operated by private companies. Since they are not constructed according to uniform standards of width and depth, and the locks in particular have different dimensions, through traffic often cannot move over several canals without unloading. Amalgamation of canal companies, which had improved this situation was not favored by those railroads in control of some of the canals.

When in the thirties the overdevelopment of traffic facilities began to endanger not only railroads and

[38] Cf. *Hauptverwaltung des Reichskraftwagenbetriebsverbandes*, R. K. B. Bericht, Jena, 1938.

[39] *Ibid.*; Homberger, Ludwig M., "Coordination of Road and Rail Transport and the Organization of the Trucking Industry," 17 *Journal of Land and Public Utility Economics*, 216.

[40] Moulton, Harold G., *Waterways, Inland, Encyclopaedia of the Social Sciences*, New York, 1935, vol. VIII, p. 377 et seq.; Napp-Zinn, Anton Felix, *Binnenschiffahrt und Eisenbahn*, Leipzig, 1928; Closset, M., op. cit.

motor carriers, but also the water carriers, some governments considered imposing restrictions on water transportation. Licensing has been used for this purpose in a way similar to that in the motor-carrier field. In France, under the regulations of 1934, licenses were required, and a license for a new vessel may not be issued unless a vessel in service at that time was retired. The Canadian Transport Act of 1938 requires licenses for water carriers operating over inland waterways, between Great Lake ports, and in the coastwise trade. There are, however, far-reaching exemptions. In particular all traffic in bulk commodities is exempted as well as intercoastal traffic, traffic between the Maritime Provinces and Great Lakes ports, traffic in the Maritime Provinces, and on the eastern part of the St. Lawrence river. In Germany, the Minister of Transport has been authorized by the laws of 1933 to restrict even the use of existing equipment; the owners being compensated out of funds of the industrial associations, measures designed primarily to protect the water-carrier industry against uneconomic expansion, not to limit it in favor of rail and highway carriers. Under the present regime, as well as in previous periods, the Government has sponsored water transportation through regulation of railroad rates by forbidding competitive rail rates in many cases and by demanding special rates to and from inland ports even for commodities which could have been hauled over the rails all the way through.

In France, the policy of dividing the functions of the different modes of transportation included waterways. Private carriers were forbidden to do for-hire business. Regional commissions were appointed which prepared rules for the division of traffic, and arranged for agreements on rates between rail and water carriers. Water transportation was considered a convenient way to haul bulk commodities of low value. Commercial carriers were required to apply for permission when they intended to engage in traffic in other commodities, such permission being denied unless traffic of the same kind had moved over waterways in preceding periods. This method is adopted to prevent water carriers from taking the "cream" away from the railroads which have the duty of service.

In Great Britain, no regulation of rates or other restrictions are in evidence. Some voluntary cooperation between canal and railroad companies has developed, sponsored by the Transport Advisory Council.

In France and Germany railroads have operated water services to a limited extent. British and Canadian railroads do a large shipping business, and British railroads also own and operate extensive dock facilities.

To sum up, the coordination of all modes of transportation can hardly be achieved without including water transportation in the general scheme of public action. This has been realized in different countries. It is, however, of interest to note that in some quarters much hesitation exists about adopting a comprehensive system of regulation in this particular field.

Air

Air transportation [41] has not yet entered the competitive struggle between the different modes of transportation. As in the United States, public action abroad has been mostly concerned with measures for increasing the safety and reliability of scheduled flights, with the construction of airports, the maintenance of airways, and aids to air carriers through mail contracts [42] and other forms of subsidies. Regulation of transportation charges has as a rule been a consequence of dealing with the subsidy problem. With few exceptions air transportation is in the hands of privately operated companies. In almost all European countries as well as in Canada, national air companies are in existence, most of them formed through amalgamation with, or absorption of smaller companies. In many countries, such as Great Britain, France, Germany, the Netherlands, Denmark, and Canada, the governments have invested public funds in these companies, or have undertaken to guarantee capital and interest. They usually possess voting rights and representation on the boards.

International cooperation between air carriers is based on treaties between governments and on the work of the International Air Traffic Association, formed in 1919, of which most European companies and some companies operating in other continents are members. In Europe, air traffic between countries has usually been arranged on the principle of reciprocity. European, as well as American, companies had considerable interests in other continents, in particular in South America and in the Far East.

Friendly relations of air carriers with rail and other operators have facilitated some degree of cooperation. British and Canadian railroads have financial interests in air companies. South African Airways, which operates all scheduled air services within the Union, is owned entirely by the South African railways. In France, a committee of the Transport Advisory

[41] Van Zandt, J. Parker, *European Air Transport on the Eve of War*, 1939, Northfield, Vt., 1940; Ziegler, Joseph, *Die Bedeutung des Luftlinienverkehrs im neuzeitlichen Transportsystem*, Dresden, 1938; Schnitzler, Reinhold, *Luftverkehr*, Berlin, 1938.

[42] In Europe, first-class letter mail is transported by air over many routes without extra charge when this method means quicker delivery, but this is optional on the part of the post office and not a matter of right.

Council, "Fer-Air-Mer," was in charge of coordination of rail, air, and ocean transportation. Combined return tickets were introduced. A similar kind of cooperation between railroads and air carriers exists in Germany. Tickets can be used there on railroads when scheduled flights have to be cancelled for technical reasons and baggage of air passengers can be checked at railroad stations without extra charge. No conflicts between air and other carriers are in evidence.

Organization of Railroads

Cooperation—Consolidations

In all parts of the world, railroads came into existence as units of limited size. Many expanded during the Nineteenth century. At the beginning of the Twentieth century, in no important country was there one system covering the territory of the whole nation. In the following period, the increasing speed in operation, and new methods of communication changed the concept of distance, and consequently of the size of areas which should be served by a single agency. World War experience added to these tendencies. Both for the Allies and for Germany and her confederates there were instructive examples of the advantages derived by operating in large areas under unified control.

The development after the World War was twofold. On the one hand, throughout Europe (with the exception of Russia) railroad cooperation was much improved by concerted action of government and management.[43] The legal provisions for passenger and freight traffic were unified. Schedules for long distance passenger and freight services were prepared. Common rules for technical devices (brakes, couplers, and containers) were adopted. The existing regulations for interchange of passenger and freight cars were revised.[44] Railroad transportation in this area would have presented a picture of cooperation similar to that in the area covering the United States, Mexico, and Canada, if the work of the transportation experts had not been upset by the increasing difficulties of money exchange and other trade barriers. On the other hand, in various countries the opinion about the advisability of encouraging interrailroad competition changed gradually. In Great Britain, after the World War, many suggestions were made to nationalize, or at least to unify, the great number of existing railroad networks in order to improve operating results, but much opposition was voiced against such a solution. The Railways Act of 1921 did not provide for Government operation. Under this Act, however, about 120 railroad companies were amalgamated into four companies; the London, Midland and Scottish (6,845 miles),[45] the London and North Eastern (6,349 miles), the Great Western (3,782 miles), and the Southern Railway companies (2,169 miles). But the areas to be served by each of the new companies were not clearly defined. In many instances, it remained possible to use different routes for journeys and shipments between the same points until in the 1930's the Government permitted pooling arrangements between the companies, eliminating railroad competition almost entirely.

The French main-line system consisted up to the end of 1937 of five privately operated and two government-operated units. Railroad competition was not much in evidence, but, as already described, public finances were adversely affected by rail deficits. The Government, therefore, wanted to increase its influence upon the management and to secure all possible economies through unification. By the decree of August 31, 1937, the main-line railroads were amalgamated into the French National Railroad Company (26,520 miles) which started operation January 1, 1938.

In Germany, for many decades, the greatest part of the railroad system had been owned and operated by the eight major states. These networks had served primarily the areas of the states, but for traffic over longer distances some competition had taken place. Under the law of March 30, 1920, the state railroads were amalgamated into the German National Railroads (39,851 miles). Political[46] and economic considerations were the reasons for this decision.

The main railroad system of Canada[47] consists of two great networks: the privately owned and operated Canadian Pacific Railway (21,257 miles) and the government-owned Canadian National Railways (23,790 miles). At the end of the World War the network of the Canadian Pacific was completed through new construction and absorption of other lines except for insignificant extensions in later years. The Canadian National Railways was created in 1919 through amalgamation of railroads already under government operation and of those which were taken over because private operations had failed to attain financial success. Whereas the Canadian Pacific was, up to recent years, a profitable enterprise, the Canadian National had considerable financial difficulties. Amalgamation of the two corporations, either through nationalization of the

[43] Wolf, Paul, *Die Deutsche Reichsbahn und ihre Beziehungen zu ausländischen Eisenbahnen*, Berlin, 1931.

[44] As example of good cooperation there may be mentioned also: organization of clearing houses for interline accounting and publication by the great systems of consolidated time schedules (official guidebooks) for international passenger and freight services, which show all connections between important points.

[45] Mileage figures are for 1938 unless otherwise indicated.

[46] It is almost forgotten that the agreement of the Bavarian Government to the amalgamation was the compensation for assistance in the reconquest of Munich, occupied at that time by Communist rebels.

[47] de T. Glazebrook, G. P., *A History of Transportation in Canada*, Toronto, 1938. Jackman, W. T., op. cit.

Canadian Pacific or by making this company the basis for management, was often proposed [48] but was rejected by the Duff Commission appointed in 1931 to investigate the transportation situation in Canada. The Canadian National and Canadian Pacific Act of 1933 has established legal provisions for closer cooperation between the two railroads. Not much progress can be recorded as result of this legislation.

Finally, an example might be given of a smaller country where nationalistic tendencies have influenced transportation policies. The Turkish railroad system [49] had consisted, after the World War, of several privately owned railroads which had been financed mostly by foreign capital. In the following period a growing state railroad system was developed by new construction and the acquisition of the privately operated lines. At the end of 1937, 2,100 miles of private railroads were nationalized and, with 1,967 miles of newly constructed lines, amalgamated into a system of 4,067 miles. Nearly 700 miles were under construction at that time. This enabled the government to initiate a policy of promoting the economy of the country besides taking advantage of the unification of operations.

This survey reveals how different the underlying reasons were for the same development in various countries. It remains to be seen what economic results were obtained through all these amalgamations. Not much can be reported in this respect about Canada. In France, the period which elapsed between the unification and the beginning of the present war was too short to gain much experience. The reports about Turkey are favorable. In Great Britain and Germany, the common opinion is that the service has been improved and considerable economy achieved. The savings cannot be expressed in figures because, as C. E. R. Sherrington [50] points out, "the conditions have not been static and the state of *coeteris paribus* has never obtained." However, a study of the situation in both countries indicates that overhead expenses have been curtailed and duplication of services and facilities abolished. Train operation without regard for former boundaries, standardization of materials and equipment, improved work-shop organization, and centralization of research have increased the efficiency. In Great Britain the problem of the weak lines was solved through absorption into stronger units. In Germany, after the amalgamation, all areas of the country could properly be cared for including those with low density of traffic, such as the rural districts of Southern Germany and East Prussia where facilities and services were greatly improved. Already in 1920 equal rates throughout Germany, based on a scale tapering with distance, were established not only in order to increase the movement of traffic but also to aid the development of areas lacking natural resources. Table 4 shows the size of railroads under unified management.

TABLE 4.—*Miles of Travel and Ton-Mileage of Railroads Under Unified Management, 1938*

Railroads	Miles operated	Freight ton-miles (millions)
Russian National Railroads	52,665	[1] 244,873
German National Railroads	39,851	47,797
French National Railroads	26,520	16,204
Canadian National (system)	23,790	14,505
Canadian Pacific (system)	21,257	13,359
Southern Pacific Railways	15,299	15,457
South African Railways	13,238	6,643
New York Central (system)	11,303	23,171
Pennsylvania (system)	10,923	27,735
London, Midland, and Scottish	6,845	5,880

Sources: Interstate Commerce Commission, Statistics of Railways in the United States, Washington, D. C. *Bulletin de l'Union Internatinale des Chemins des Fer*, Paris, April-May 1939; Poor's Publishing Company, *Poor's Railroad Volume*, New York; *Universal Directory of Railway Officials and Railway Yearbook*, 1939–1940, London. *Britannica Book of the Year, 1941*, Chicago.

[1] cf. Note to table 1 p. 310.

A striking example of the disadvantages deriving from the lack of unification is presented by the railroad situation in Australia. The greater part of the network is owned and operated by the States and a smaller part by the Commonwealth Government. The total mileage on the mainland is 26,591 miles of which 6,132 miles have a gauge of 5 feet 3 inches, 7,296 miles a gauge of 4 feet 8½ inches, 13,011 miles a gauge of 3 feet 6 inches, 122 miles a gauge of 2 feet 6 inches, and 30 miles a gauge of 2 feet. It goes without saying that this lack of uniformity hampers through traffic considerably. Efforts made by the Commonwealth Government toward standardization of gauges and coordination of railroad services have not as yet met with success.[51]

Efficient Management

Efficiency in railroad management [52] depends largely on the form of organization; government ownership or private ownership. Many attempts have been made to find yardsticks for measuring results obtained under the different forms in use. Comparisons of international figures, however, such as profits and losses,

[48] Cf. Beatty, E. W., *The Question of Railway Unification*, The Annals of the American Academy of Political and Social Science, September 1936, vol. 187, p. 164 et seq.

[49] Dieckmann, *Die Türkischen Staatseisenbahnen*, Archiv fuer Eisenbahnwesen, Berlin, 1938, p. 739 et seq.

[50] *A Hundred Years of Inland Transport*, London, 1934, p. 318.

[51] Commonwealth of Australia, *Report on Commonwealth Railways Operations for the year ended June 30, 1939*, Canberra.

[52] Splawn, Walter M. W., *Government Ownership and Operation of Railroads*, New York, 1928; Daggett, Stuart, *Principles of Inland Transportation*, revised edition, New York, 1934, chapters XXXVI et seq. (in the 3d edition (1941) most of the information on foreign railroads is omitted); Witte, Bernhard, op. cit.; Association of American Railroads, *Private Ownership and Operation versus Government Ownership and Operation of Railroads in the United States*, 1939; Sorrell, Lewis C., *Government Ownership and Operation of Railways for the United States*, New York, 1937.

operating ratios, and average revenues per passenger and per ton-mile, though throwing interesting sidelights, do not serve this purpose. This has been particularly true in recent years when numerous currencies have lost stability and when their value in international markets has differed from the buying power in the homeland.

In some European countries, such as Hungary, Yugoslavia, Poland, Russia, and Germany (until 1924) railroads have been operated by government departments, or by government agencies ("General Directions") working under immediate orders of the respective departments. Such form of organization has the disadvantage that successful conduct of the railroad business can hardly be expected through employing the usual methods of government administration. This applies in particular to budgeting and financial control as well as to the problems of personnel. When not only the higher officials but also the great mass of clerks, station agents, train crews, and foremen are in the civil service [53] it is not feasible to reduce the number of employees promptly in accordance with decreasing traffic requirements. This is even more difficult than it proves to be in the United States under the existing agreements between managements and labor. Furthermore, it is difficult to retain in railroad service outstanding administrators and men of high technical skill when paid under civil-service classifications. The greatest handicap for efficient management, however, is the role which undesirable political pressure plays in government-operated railroads.[54] These considerations have led to world-wide studies as to whether an organization could be devised for government-owned railroads which would secure efficient managerial methods and eliminate political interference. For a considerable period, many experts held that "autonomy" of railroads would best serve these objectives.[55] What railroad "autonomy" means will be illustrated first by discussing some of the experiments undertaken in different countries.

The largest government-owned railroad system which was organized as an autonomous corporation was the German National Railroad Company.[56] It was formed under the laws of August 30, 1924, which had to be enacted under the provisions of the London Agreement of August 16, 1924, following the recommendations of the Dawes Plan for the settlement of Germany's reparations. The international interest was concerned with creating an organization apt to secure the payment by the company of a considerable portion of Germany's reparations. The main provisions of these laws can be summarized as follows: (1) The ownership of the railroad facilities and of the equipment rested with the Reich, the company being in charge of operations. (2) The common shares of the company belonged to the Reich. A limited amount of preferred shares could be offered to the public. (3) The Company had to operate in accordance with business principles, due regard being paid to Germany's economic interests. (4) The Board of 18 members, half of whom were nominated by the Government, half by the Trustee representing the Reparation Bonds, were to control the management and to decide all questions of importance. Members of the governments or parliaments were not eligible for the Board. The directorate in charge of the management consisted of the Director General and Directors (vice presidents) appointed by the Board, such appointments being subject to confirmation by the President of the Reich. (5) The Government had the right to supervise proper maintenance of the property and adequate services as well as to regulate rates and fares. (6) Differences between the Government and the company could be submitted to a special tribunal. (7) "National Railway Officials" included employees of all ranks who under Government operation would have been in the civil service. The salaries were on the average the same as those in corresponding civil-service positions. However, the company could grant special bonuses to the employees and could fix the salaries of the "leading officials." In accordance with an international settlement, some of these provisions were changed by the law of March 30, 1930, in particular those relating to the participation in management of representatives of the creditor powers. When the present regime came into power, the autonomy soon became a formality. By the laws of February 10, 1939, and July, 4, 1939, the autonomy provisions were repealed almost entirely. Since 1937, the Ministry of Transport has been in charge of the management of the National Railroads.

During the period of full autonomy the management

[53] The term "civil service" is used here to indicate a well-protected public employment in which, after a comparatively short period, the employee acquires a permanent status. It is realized that in many respects the present American civil service is a more flexible institution than that in European countries.

[54] It seems worthwhile to note that throughout the world the mail service has for centuries been in the hands of government departments, which in most European countries operate telegraph and telephone also. Public interest usually centers less in these activities than it does in railroad construction, services, and charges. Therefore, few complaints have been voiced about political interference in the communication fields.

[55] An interesting American study on these lines is the Federal Coordinator's "Tentative Plan for Public Ownership and Operation of Railroad Systems of United States," *Regulation of Railroads*, S. Doc. No. 119, 73d Cong., 2d sess., p. 13 et seq., p. 82 et seq.

[56] Hauptverwaltung der Deutschen Reichsbahn-Gesellschaft, *Wirtschaftsfuehrung und Finanzwesen der Deutschen Reichsbahn*, Berlin, 1934; Sarter, Adolph, and Kittel, Theodor, *Die Deutsche Reichsbahn-Gesellschaft*, 3 ed., Berlin, 1931. MacMahon, Arthur W., and Dittmar, W. R., "Autonomous Public Enterprise—The German Railways," *Political Science Quarterly*, New York, 1939, p. 481, 1940, pp. 25, 176 et seq.

had considerable leeway. It was possible to improve the methods in use and establish sound principles for conducting financial affairs. Parliament, however, made many efforts to interfere with these activities. When such attempts met the resistance of the Board and of the Directorate, considerable frictions resulted. The legislators, unable to change the laws under the existing international agreements, soon resented the limitations on their power. It can be taken for granted that they would have altered the autonomy provisions had they been in a position to do so.

After this somewhat detailed analysis of the German experience, some data about similar experiments may be instructive. Italy is the first country where some kind of an autonomous railroad administration was created. Under the law of July 7, 1907, a Board was formed of the Director General and nine members, appointed by the King. The Board had to decide questions of internal organization and had consultative functions in all other matters. Decisions of the Board could be changed by the Minister. The railroad budget was separated from the general budget of the government and was submitted to Parliament only in one net figure. The principles of rate making were decided by Parliament. When the present regime came into power in 1922, this kind of autonomy was abolished.

Another early example of a limited autonomy is the organization of the South African Railways under the South African Act of 1909 and the Railway Board Act of 1916.[57] This system is controlled by a Board of three Railway Commissioners who are appointed by the Governor-General-in-Council and who act under the chairmanship of the Minister of Railways and Harbours. While the final decision rests with the Minister the Board must be consulted in all important matters. A General Manager of Railways and Harbours is in charge of management. He operates the railroads according to the regulations framed by the Minister and the Board and exercises broad powers. The law prescribes that the railroads must be administered on business principles with due regard to the economic interests of the country and on a nonprofit basis. The finances of the railroads are kept separate from those of other government activities, and the railroads can claim compensation out of general government funds when the Government or Parliament require them to provide facilities or services without pay or at charges lower than costs. Parliament is in charge of budget control.[58]

In Rumania, after some experimentation, the "Autonomous Railroad Administration" was formed under the law of June 6, 1929, the German example being used to some extent. The 11 members of the Board which includes the Director General were appointed by the King. The powers of the Board were limited more than was the case in Germany, and a government commission had veto power over the decisions of the Board. Differences resulting from exercise of this veto right could be submitted to a special tribunal. Questions concerning increase in rates, however, had to be decided finally by the Council of Ministers. The budget showing the total of the revenues and of the expenses had to be approved by Parliament.

In Belgium, the organization which came into existence under the law of July 23, 1925, had likewise been influenced by the German scheme. The common shares were owned by the Government and preferred shares were issued to the public, in this case with the intention of placing a part of the public debt upon the private investor. The 21 members of the Board were designated by the King partly from lists presented by different interests, three being nominated by the personnel. Rates were proposed by the Board, but the Government could deny any increase, no appeal being possible from such a decision. Balance sheets and profit and loss accounts had to be approved by a shareholder meeting under the chairmanship of the Minister of Transport. No budget control by Parliament was in evidence. This form of organization attempted to eliminate parliamentary control but maintained the influence of the Minister. In both monarchies, Rumania and Belgium, no important changes in the outlined organization had been made before the outbreak of the present war.

In other European countries, such as Austria, Czechoslovakia, Greece, and Switzerland, tendencies toward encouraging the use of business principles in railroad management and reducing the possibility of political interference could be observed. Studies of the experience in these countries, however, indicate that political interference was checked only to a limited extent. The spread of the totalitarian form of government over Europe would render all such efforts illusory.

Of great interest is the development in Canada, where the National Railways were controlled up to 1933 by a board appointed by the Dominion Government. The Duff Commission recommended in 1932 measures to avoid political interference. Following

[57] Cf. *Report of the Railway and Harbour Affairs Commission* (usually cited "the Granet Report"), Pretoria, 1934, p. 9, 23 et seq.

[58] In his 1939 report the General Manager recommended a change in organization and the appointment of a Directorate of Railways which should take over the administration. It should include the General Manager as chairman, two railroad officials, two members nominated by the Minister, and four members nominated by the representations of agriculture, industry, and commerce. Other features of increased autonomy are not mentioned.

these recommendations in part, the Canadian National-Canadian Pacific Act of 1933 provided for the appointment of three trustees by the Governor-in-Council for the control of the National Railways, the independent position of the trustees being protected by special provisions. When in 1936 the party in power changed, a new law was passed which transferred the control to a Board of seven directors. Of the trustees whose terms of office had not expired at that time, two resigned and one was dismissed. Since the Canadian National Railways have been dependent upon public money the Parliament has retained a final control of the railroad budget through a standing committee for railroad and shipping matters. Opinions differ greatly about the possibilities of political interference. In an address on June 27, 1939,[59] the Canadian Minister of Transport, Mr. C. D. Howe, pointed out that the management of the Canadian National is amply protected by legislation and that the directors are the type of men who would not stand for government interference. Mr. R. C. Vaughan, who was recently appointed President of the Canadian National Railways, stated categorically that political interference did not enter into the management of that system. Professor W. T. Jackman,[60] however, is of the opinion that "the management is subjected to all the forces of political pressure which the Royal Commission hoped to obviate by the Board of Trustees."

The London Passenger Transport Board, already mentioned as an efficient operating agency, is another example of an autonomous corporation the activities of which, however, are confined to passenger traffic. The Board consists of seven members appointed by the "Appointing Trustees."[61] Construction of new facilities and raising of capital has to be sanctioned by Parliament. No political interference in the actual business is reported.

Finally, the organization of the French National Railroad Company[62] may be outlined, 51 percent of the capital stock of which was owned by the Government and 49 percent by the companies which had been operating companies up to December 31, 1937, and which were to function as holding companies for a transitory period, such shares being blocked during this time. The Board consisted of a Government official as President, 13 other Government officials, 2 railroad experts appointed by the Government, 4 representatives of the personnel, and 12 representatives of the holding companies, these last to be replaced later by 6 shareholder representatives. The Director General was appointed upon the recommendation of the Board by the President with the consent of the Government. The budget had to be submitted to the Government. The provisions for avoiding deficits through parliamentary decisions have already been described. The company had the legal status of a private corporation. The shareholder meeting, however, had consultative functions only. This scheme gave all the power to the Government which could avail itself of the advice of private industrial and other experts. The use of business methods in management was to be continued.

After studying these experiments undertaken in various countries the main criteria of autonomy of government-owned railroads might be presented as follows: (1) Elimination of management control by the Parliament; (2) decreased power of government departments, regulation instead of administration; (3) separation of the railroad budgets and accounts from those of the State (including special audit of railroad accounts); (4) possibility of appeal from government actions; (5) control of management by an independent board and use of business principles; and (6) increased freedom in matters of personnel. In the examples discussed, these principles are adopted wholly or in part. The effectiveness of this form of organization has largely depended on the extent to which they were used. It can be stated that autonomy of government-owned railroads offers considerable advantages for adopting business methods for improved economy and efficiency. In totalitarian states no form of organization can keep the ruling forces from dictating managerial policies. In a democracy, it would probably be difficult to prevent, in the long run, undesirable political pressure upon managerial activities. This would be particularly true should railroad deficits become a drain on public finances. Experience has shown that such undesirable interference is more likely to occur in the field of railroads than in others where autonomous corporations have been known to function successfully.

Finally, one special aspect of the problems discussed in this chapter deserves a brief comment. A somewhat undesirable division of responsibility takes place when

[59] *Canada's Railway Problem,* Address of the 49th Annual Meeting of the Railway Accounting Officers, 53d report of the Railway Accounting Officers, Association of American Railroads, p. 53 et seq. Cf. also *Railway Gazette,* September 19, 1941, p. 279.

[60] "Appraisal of Government Ownership and Operation of Railways in Canada," *The Annals of the American Academy of Political and Social Science,* Philadelphia, January 1939, p. 175 et seq.; cf also G. P. de Glazebrook, op. cit., p. 415 et seq.

[61] It may be of interest that this body consists of the Chairman of the London County Council, a representative of the London Traffic Advisory Committee, the Chairman of the Committee of the London Clearance Banks, the President of the Law Society, and the President of the Institute of Chartered Accountants in England.

[62] Closset, M., op. cit., p. 225 et seq., Verbeck, *Der Verwaltungsaufbau der Nationalgesellschaft der französischen Eisenbahnen* Archiv fuer Eisenbahnwesen, 1939, Berlin, p. 1529 et seq.; Dougall, Herbert E., "Public and Private Operation of Railways in France"; and Harcavi, Georges, "Nationalization of the French Railways," *Annals of the American Academy of Political and Social Science,* Philadelphia, January 1939, p. 211 et seq., 217 et seq.

transportation agencies are privately owned and a regulatory government agency, not directly responsible for their financial returns, is in the position to exert great influence upon rates and other items which reflect decisively upon these returns. The same situation, however, exists when a government agency has regulatory powers over an autonomous government-owned corporation. At first sight, this division of responsibility seems not to exist when a government department is in charge of operation. But besides the parliamentary control there are instances when even such a department is not omnipotent; other departments often try to interfere, in particular with rate policies. In Germany, for instance, before 1924 major changes in freight rates had to be decided upon by the cabinet of ministers who usually felt little responsibility for railroad finances. Consequently, although the division of responsibility proves almost impossible to avoid entirely in a democracy, it is nevertheless preferable to departmental operation.

Emergency Measures of Control and Coordination

Since the outbreak of the present war, a series of interesting developments has taken place [63] which will be outlined briefly. In comparing the actual situation today with the World War experiences, the availability of more transportation facilities seems at first sight to be a great advantage. Under European conditions, however, which are different from those which prevail in America, only limited use has been made of the new forms of transportation. The shortage of fuel, in particular of oil, under which Great Britain and the continental powers all suffer, prompted unavoidable changes in existing plans of the division of functions between the different carriers.

Increasing restrictions have been imposed on highway transportation in all these countries. In Great Britain the chairman of the Licensing Authorities were appointed Regional Traffic Commissioners with power to distribute fuel and to curtail motor traffic, diverting it whenever advisable to railways or waterways. In France also, before the German invasion, motor carrier activities were much more limited than under peace-time legislation. On the other hand, the existing regulations for distribution of traffic between rail and inland water carriers were suspended and shipbuilding encouraged. The restrictions on motor traffic in Germany have been even more severe; the use of private and commercial vehicles has been greatly curtailed, only emergency transports being permitted.[64] Nevertheless, the construction of the Reichsautobahnen has been pushed forward. A comparison between two maps published in the *Railway Gazette* (London), one on November 17, 1939, and another on August 16, 1940, reveals the great progress in completing links between important points. Additional construction has been reported since the publication of this map. The superhighways seem to have proved useful for quick military movements. Water transportation has also been intensified. New special inland port tariffs, as well as joint water-rail rates, hitherto unknown in Germany, have been established in order to induce shippers to use waterways instead of railways. This is only one of many examples where rate making is being used as a tool for changing the division of function between the different modes of transportation.

The railroads in the belligerent countries carry heavy war loads. Restriction of passenger schedules, of dining and sleeping car facilities, and discontinuance of first-class schedules, as well as measures against car shortages (e. g., increase of demurrage charges, decrease of free time for loading and unloading), and limitations on freight traffic are reported from all these systems. Transportation charges have been increased in order to decrease the volume of traffic.

World War experience was used in part for changes in transport organization. As in the United States, the railroads in Great Britain [65] were taken over by the Government during the World War. They were controlled by the Railway Executive Committee which left the day-to-day working in the hands of the existing managements. At the outbreak of the present war the same method was adopted for the control of the four railway companies, and the London Passenger Transport Board. The financial arrangements are different. Under an agreement which was in force for the first period of the war, the Government guaranteed the net revenues of the companies which were obtained during a test period (approximately 40 million pounds). The Government had the right to participate to one-half in new revenues exceeding 43.5 million pounds and to obtain all net revenues which exceeded the standard revenue (68.5 million pounds). Rates had to be adjusted from time to time to meet changes in wages and prices. This agreement which soon made increases in rates unavoidable was severely criticized. A new agreement was reached in the summer of 1941, which provided for a fixed rent of 43 million pounds, which is higher than the net revenue of

[63] Cf. *Railway Gazette*, London; *Modern Transport*, London; *Revue Général des Chemins de Fer*, Paris; *Die Reichbahn*, Berlin; U. S. Department of Commerce, *Foreign Railway News*; *Foreign Inland Waterway News*.

[64] An interesting feature is the emergency transportation of express in passenger cars with and without trailers.

[65] Pratt, Edwin A., *British Railways and the Great War*, vols. I and II, London, 1921.

the test period but considerably lower than the standard revenue.[66]

An important development has recently taken place in the organization of the British Government Departments in charge of transportation. Until May, 1941, inland and ocean transportation were controlled by two different departments: the Ministry of Transport and the Ministry of Shipping. Port operations, in particular, were controlled by the Ministry of Transport. Under an Order in Council of May 9, 1941, these two Ministries were amalgamated into the Ministry of War Transport. The objective of this change was to give effect to the concept of shipping and inland transportation as one continuous operation and to avoid overlapping of functions. A Port and Transit Control Division at the Ministry is in charge of port operations. Inland transportation has been brought under a Deputy Director General in charge of the railroad, highway, and inland waterway transportation sections which operate in close touch with the Port and Transit Division.

The problems of coordinating the modes of inland transportation were studied early in 1940 by the Transport Advisory Council which suggested in its report of May, 1940, an emergency organization for coordination of different modes of transportation. A central committee representing rail, road, motor, inland water, and ocean transportation would act in an advisory capacity and prepare plans for distribution of functions between the carriers. Regional commissions would assist the transport commissioners and work out agreements between the competing transportation agencies on handling traffic. Local subcommittees would have similar functions in smaller areas. In the situation prevailing at that time in Great Britain, the Minister of Transport rejected these suggestions. Almost one year later, on April 5, 1941, the War Transport Council was organized. After the formation of the Ministry of War Transport it was renamed the Inland Transport War Council. It consists of the Chairman of the Transport Advisory Council, of representatives of the carrier and shipper interests as well as of transportation labor who as individuals serve upon appointment by the Minister under his chairmanship. The Council has the function of advising the Minister on matters referred to it and of putting forward proposals for increasing the coordinated contribution of transportation toward the war effort. Nothing can as yet be reported on the achievements of the Council. Priorities and preferences are dealt with by a Ministerial Priority Commission. One of the six Priority Subcommittees on which all interested departments are represented is in charge of transportation. Decisions must be enforced by the Railway Executive Committee, the Regional Transport Commissioners, the Port Emergency Commission and the canal undertakings. On January 23, 1941, a special organization in the Ministry of Transport (usually referred to as the "Transport Pool") was set up to expedite the handling of government traffic over highways. For this purpose private vehicles have been leased which are being maintained and operated by the owners under the control and under the orders of this organization. The Road Haulage Advisory Operations Committee, which had been set up in July, 1941, has the task of advising the Government on these and other matters of motor-freight transportation. Government field offices are in charge of directing this kind of traffic. They also have the function of disposing of Government traffic which is not carried in vehicles owned or leased by the Government, and of other important traffic (e. g., clearing of ports). In order to allocate this traffic, the commercial carriers have set up the Hauliers National Traffic Pool. Commandeering of private vehicles for use in emergencies is prepared under the authority of the Regional Traffic Commissioners.

During the World War the whole transportation system in France was placed under military control.[67] The same step was taken in September, 1939. But in November, 1939, the control was returned to the Ministry of Public Works where a Director General of Transportation assisted by a military board was in charge of all forms of transport as long as France carried on the war.

Both in the homeland and in the occupied territories Germany during the World War operated under a Chief of Field Railroad Operation, who controlled a system 40 percent larger than that existing in Germany proper.[68] Now the railroad system under her control has greatly expanded. Operations in the occupied zones are carried out in part by the National Railroads, and in part by military transport authorities. The need for improved cooperation among the carriers seems to be apparent in Germany also. A new organization for coordination of rail-motor, inland water, and ocean transportation "in peace and war" was created in

[66] During the first month of the war, government traffic was moving at agreed charges, which were different for the different departments. Under an arrangement which was made early in 1941, rates for government traffic were based on regular tariffs; rebates, however, were fixed at the same level for all the departments, which varied between 10 and 20 percent, according to the category of traffic. Under the new general agreement rates for government traffic will only be of statistical interest.

[67] The book by Wilgus, William J., *Transporting the A. E. F. in Western Europe*, 1917–1919, New York, 1931, reveals how many difficulties arose from railroad operations in France by French, American, and English units.

[68] Sarter, Adolph, *Die Deutschen Eisenbahnen in Kriege*, Stuttgart, 1930.

September 1940.[69] The central agency consists of the division heads in the Ministry of Transport. Three agencies for larger areas and districts agencies covering the region of each railroad division have been formed. In the area and regional agencies, representatives of the different modes of transportation will have to work together. The private carriers of property are organized in order to secure full use of trucking space. The industry is divided into groups (Transportgemunschaften) which are forced to pool the traffic of all members of each group. Conveyance by private truck of merchandise over 100 kilometers (6.2 miles) is forbidden when no sufficient return load is available.

The gloomy picture of European transportation shows the existence of considerable strain in many quarters, a strain greatly increased by modern means of warfare. The efforts made to overcome prevailing difficulties through the different methods in use will have to be watched for future results.

Conclusions

The foregoing study shows how public action in foreign countries deals with transportation problems under principles which differ widely in various periods, and under changing forms of government. The existing systems of railroad organization and their usefulness for increasing the efficiency and economy of operations have been discussed. A survey of the principles of rate making adopted in leading countries reveals how it can become a tool for promoting government objectives in many fields which lie sometimes far beyond the sphere of transportation. The development of new traffic facilities on a large scale has prompted many attempts of differing scope to regulate competing agencies. Plans for distribution of functions and for coordination of all modes of transportation are for the most part still in a stage of evolution. But serious efforts could be recorded toward proper solutions facilitated by unified government activities in all branches of transportation. Experience gained during the present war indicates the importance of prearranged programs of transport coordination in national emergencies in order to utilize effectively the potentialities of existing systems.

It seems perfectly clear that no method in use abroad should be copied indiscriminately in this country. But the analysis of the methods adopted in foreign countries and of the historical, economic, political, and other reasons which have led to their employment may prove useful for coping with issues which are facing American transportation in our time.

[69] Cf. also *Coordination of Transport:* Germany, Railway Research Service, *Monthly Bulletin,* London, January 1941, p. 1 et seq.

PART II
SPECIAL STUDIES

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PART II—SECTION I
AIR TRANSPORT

J. Parker Van Zandt [1]

NATURE OF AIR TRANSPORTATION

Introductory Appraisal of Its Significance

It has been said that the air is an uninterrupted navigable ocean that comes to the threshold of every man's door. For centuries mankind has stood on the shore of this uncharted sea and yearned to enter it "while sparrows from the hedge took flight and taunted us."

Today those wings are ours. How shall we use them?

Undue conservation and extravagant prophecy can be equally misleading. The undeniable fact is that flying introduces a revolutionary, unpredictable element into human affairs. It represents a fundamental revision in the ways of mankind.

What this may ultimately mean in terms of human relationships, when exploited and developed to its uttermost possibilities, is difficult to exaggerate. Europe in the summer of 1940 is an object lesson of some of its implications in the international political field.

Just as the first World War gave an immense stimulus to aviation, particularly in its technical phases, so the present world conflict has tremendously accelerated the metamorphosis of age-old, earth-bound concepts. It is creating a three-dimensional consciousness, an awareness of the personal implications of flight on the part of countless millions of people throughout the world.

Our problem here is to evaluate these changes, as they affect the United States, in terms of 1950 or 1960; to indicate both the direction and the distance we may reasonably expect to advance under wise guidance, during the next decade or two. One thing may be said with certainty: air transport is not just another medium of travel, a collateral service, added to already existing forms of transportation. It is an open sesame to a new world.

[1] The opinions expressed in this report are those of the author and are not necessarily sponsored by any agency. Mr. Van Zandt, Consultant to the Civil Aeronautics Board, has been actively connected with the aviation field for the past 23 years. He holds pilot license No. 17 and has been associated with a number of air transportation enterprises, including Pan American Airways, Scenic Airways, Stout Air Services, and many other aviation activities.

Mr. Royce A. Wight, of the Civil Aeronautics Board staff, assisted in the preparation of much of the data.

Social, Political, and Economic Implications

With the introduction of air travel and new communication technique, the world has been shrinking at a rate unprecedented in history, and it continues to shrink. Political boundaries, on the other hand, have remained relatively rigid in terms of physical dimensions. The natural result is that boundaries have become more and more restrictive from the standpoint of economic activity. This conflict between technology and politics has already produced symptoms of strain that are only too evident to all.

For hundreds, and in some respects even thousands, of years before the beginning of the nineteenth century, there was little improvement in the means for overcoming distance. Julius Caesar could send a letter practically as fast as Napoleon.

The water-wind-and-wood complex was followed by the coal and iron complex, which produced the steam railway and the steamship of the nineteenth and early twentieth century. Today we are experiencing the beginnings of a revolutionary new travel era. Already any important city on the globe can be reached well within 2 weeks, or in less time than it took to journey from Boston to Savannah 150 years ago.[2] The world is now actually smaller, measured in travel time, than were the Thirteen Original States that united to inaugurate George Washington as President.

What the world may become within a reasonable future may be partially visualized by drawing a circle on the globe with a radius equal to the distance which a substratosphere 300-mile-an-hour airliner[3] will be able to cover in 18 hours. Such a circle centered on Boston, for example, reaches Buenos Aires in the south, includes all of Europe, crosses Africa at Cairo, and almost touches Irkutsk in Siberia. A similar circle centered on San Francisco would include Tokio and one end of Lake Baikal. Passengers could embark late one

[2] Staley, Eugene, *World Economy in Transition*, 1939, p. 4.

[3] See Roxbee Cox, "1940 Wilbur Wright Memorial Lecture," *Journal of the Aeronautical Sciences*, September 1940, p. 697.

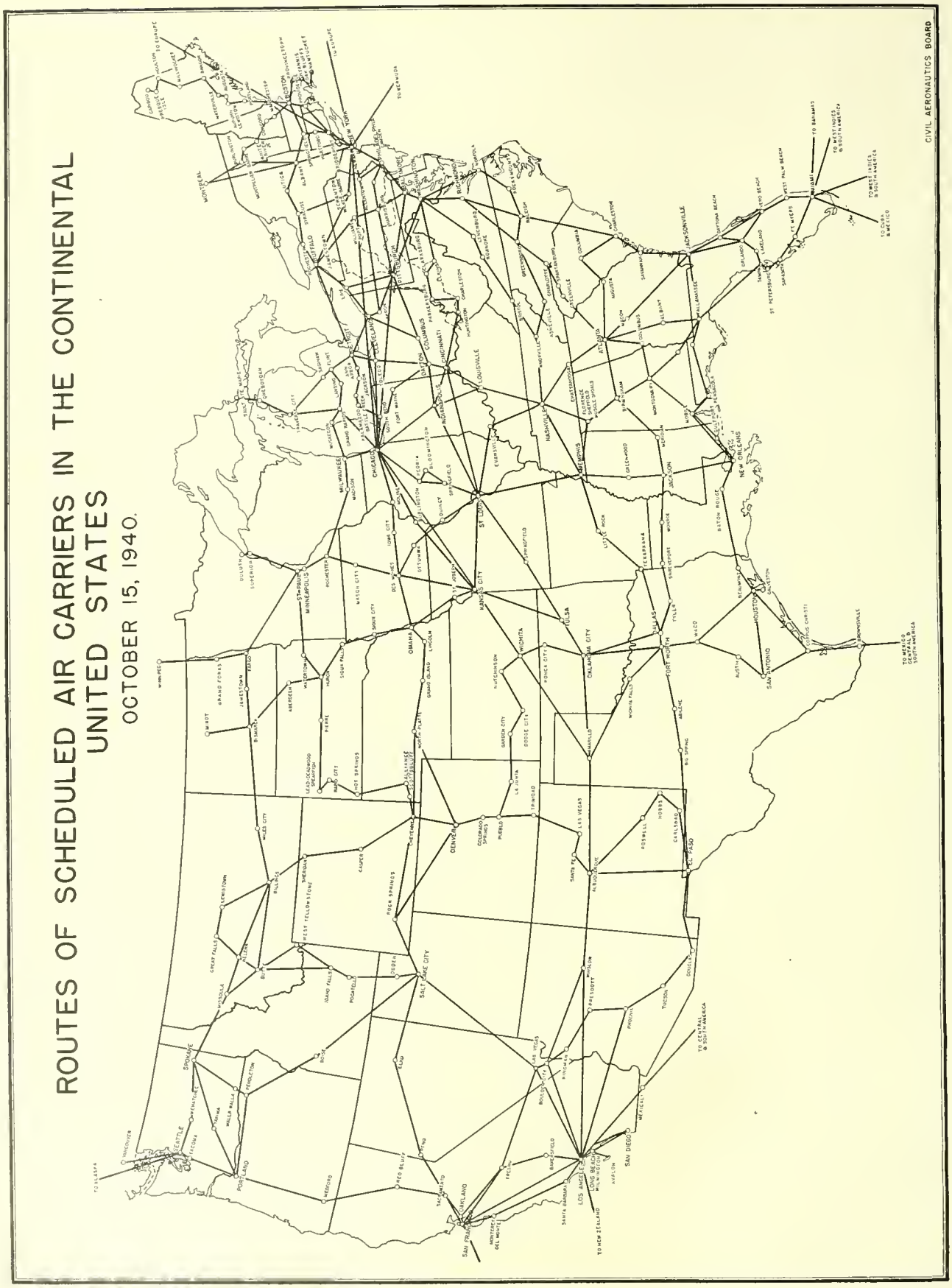

ROUTES OF SCHEDULED AIR CARRIERS IN THE CONTINENTAL UNITED STATES
OCTOBER 15, 1940.
CIVIL AERONAUTICS BOARD

FIGURE 16

afternoon and arrive at any of these destinations during the following morning.[4]

If these possibilities still seem too remote to consider seriously for the present, it is certainly conservative to forecast that in the not-very-distant future no habitable part of the globe will be more than a week's air travel time from any other part. England will be overnight from New York; Sydney 3 days from London; South America 24 hours from Europe.

In the summer of 1939 it first became possible to fly entirely around the world on scheduled air liners. The average fare per mile and over-all speed are given in Table 1.[5] How much improvement is already technologically possible in this first round-the-world schedule is suggested by the record of Howard Hughes when he circumnavigated the globe in 3 days and 19 hours in July 1938.

TABLE 1.—*Round-the-World Air Transport Schedule*

Flights	Total elapsed time including stops (hours)	Distance (miles)	Average over-all speed (m. p. h.)	Fare	Average fare per mile
London to Karachi	66	4,882	74	$398	$0.082
Karachi to Hongkong	60	3,503	58	304	.087
Hongkong to San Francisco	151	8,746	58	760	.087
San Francisco to New York	16	2,640	165	150	.057
New York to London	45	4,356	97	375	.086
Full trip	[1] 338	24,127	71.4	1,987	.082

[1] 14.1 days.

The rapid technological advance of air transport during the past decade and a half is well illustrated by the 600-mile route between Los Angeles and Salt Lake City. In 1926 a passenger paid $90 for a one-way ticket and the privilege of sitting for 7½ hours on mail bags in an open cockpit of a Douglas M–2 transport. In 1940, for a fare per person of $34.75, 21 passengers can ride in comfort between the two cities in 3¾ hours, sleeping and dining aloft, with a stewardess to care for their needs en route. That is, very roughly, one-half the time for one-third the cost (and at a relatively less Government unit subsidy). New York now is an overnight trip from Los Angeles, as compared with a journey of 3 nights and 2 days by the fastest rail service. One may fly to Buenos Aires, spend 10 days there, and be back in New York in less time than it takes to go one way by steamship.

Air schedules have also been improved. Travel hours between Chicago and Los Angeles, for example, have been reduced from 23 hours in 1929 to 10 today. The present 4-day air trip from New York to Buenos Aires took 10 days a few years ago. These reductions have been made possible as much by improvement in airway facilities and organization as by the introduction of faster planes. On the international routes particularly, substantial additional savings can be accomplished by developing night schedules. Air transportation has yet scarcely begun to realize its potentialities and translate them into effective service.

During the period from 1925 to 1940 the transport land plane has changed from a small single-engine biplane carrying a pilot and two passengers, weighing 1 ton gross and costing less than $10,000, to a large monoplane with 2 or 4 engines, carrying 20 to 50 passengers plus a crew of 3 to 6, weighing up to 25 tons gross and costing $100,000 to $400,000. Flying boats for overseas transport operations have been developed weighing over 40 tons, costing more than half a million dollars and capable of carrying 70 passengers on short flights.

The average transport airplane of 1924 had a cruising speed of 100 miles an hour, using from 200 to 300 horsepower and flying at a cruising altitude of less than 1,000 feet. The 1941 airplane, equipped with a cabin under pressure, cruises in excess of 200 miles an hour, using horsepowers of 1,200 to 2,000 at altitudes ranging upward to 20,000 feet.

These changes have not been particularly uniform or gradual, but have occurred in sudden spurts as new engines, new techniques and new design tendencies have been developed. There is no reason to believe that the future will not witness further favorable innovations.

No conventional appraisal of its social, economic, and political implications can properly evaluate a technique as revolutionary as the art of flight. Winston Churchill, speaking of the British air force in the fall of 1940, said: "Seldom in history have so many owed so much to so few." Certain it is that seldom in history have the foundations of economic, cultural, and political life been more profoundly shaken.

Today we are entering an era of planetary economy.[6] Any transportation policy which does not take this basic fact fully into consideration places the future of the country in grave jeopardy.

[4] Dr. Staley, pp. 8, 10, 14, *supra*, has developed this idea interestingly by means of isochrone (equal time) maps showing the travel time between various points for different epochs; and other related data.

[5] J. Parker Van Zandt, "European Air Transport on the Eve of War—1939," *Cabot Professorship Publication No. 5*, Norwich University, 1940, table 3–a, p. 14.

[6] Lewis Mumford, *Technics and Civilization*, pp. 232–3. See also recent address by Dr. Geo. W. Lewis, Director of the National Advisory Committee for Aeronautics: "Aviation is the most important subject now facing every nation of the world because it is changing the lives and thoughts of men and our whole concept of government and power."

ORIGIN AND GROWTH OF AIR TRANSPORTATION IN THE UNITED STATES

Scheduled air transportation in the United States may be said to have begun when the Post Office Department, with the help of Army pilots, opened an air-mail route between Washington and New York in 1918. This initial air-mail service had little commercial value. The surcharge was high and performance was poor. Many schedules were canceled and pilots were frequently forced down or failed to find their destination. As a result, considerable skepticism developed regarding the potentialities of air transport.

The Government was also criticized for launching an untried air transportation experiment while the Nation was engaged in war. Thus, it was in the face of much opposition that the Post Office Department continued its pioneering efforts to develop the new medium of travel. Service was begun in 1919 between New York and Chicago. In 1920 it was extended to San Francisco. Routes were opened from Chicago to St. Louis and to Minneapolis, which, however, were abandoned the following year when all efforts were concentrated on the transcontinental service.

In 1922 the Post Office Department undertook the revolutionary project of adapting airplanes and airports for scheduled night flying.[7] A lighted airway was installed between Chicago and Cheyenne, Wyo., and on July 1, 1924, the world's first regular night service was inaugurated.

The initial postal rate of 24 cents an ounce on the New York-Washington route had resulted in so little patronage that in 1919 the Post Office decided to carry at the regular 2-cent rate such first-class mail as could be accommodated in the mail planes. With the commencement of night flying, postal officials felt the value of the service was sufficiently enhanced to justify charging excess postage.

The transcontinental route was divided into three zones and a rate of 8 cents an ounce fixed for each zone. Thus the surcharge between New York and San Francisco was 24 cents an ounce. During the fiscal year 1925, revenue derived from the sale of special stamps was in excess of $600,000. Expenditures, however, were $2,744,000.

By 1925 Government pioneering had reached a point where private operation of air transportation appeared feasible. Legislation authorizing service by contract accordingly was provided by the Kelly Air Mail Act of February 2, 1925, which created an economic basis for a civil air transport industry.

[7] See Edward Warner, "The Early History of Air Transportation," Cabot Professorship Publication No. 2, 1938, Norwich University.

Private capital was quickly attracted to the field and a number of air transport companies were organized and started operating during the next 2 years. In September 1927 the Post Office Department turned over the transcontinental route to private operators and from that time on, with a brief interlude in 1934, all air-mail routes have been flown by private air carriers under contract with the Government for the carriage of mail.

Routes

At the beginning of 1926 domestic air-mail routes in the United States totaled 2,813 miles. During the first year of operation by private contractors this increased to 8,252. By 1928 it had grown to 15,590 miles. The general prosperity of the country and, in particular, an aviation boom of the late twenties brought the route mileage up to about 30,000 in 1930. From then on until 1938 there was little expansion in the domestic air transportation system. Indeed, the length of routes in the United States actually decreased in 1932 and 1933.

Several factors contributed to this temporary halt in growth. Among them were the weakened financial condition of the air-transport industry as a result of the depression; the air-mail contract cancellations and resultant investigation in 1934; and unsatisfactory legislation governing the economic regulation of air transportation.

HAWAIIAN ISLAND AIRLINE ROUTES, OCTOBER 1940

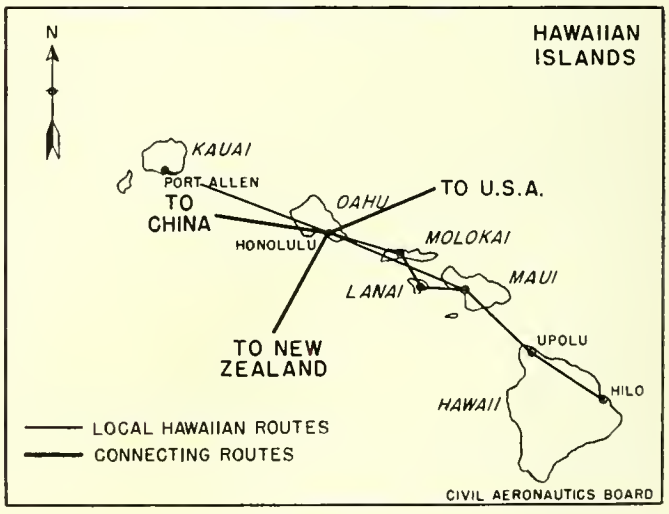


FIGURE 17

As of October 1, 1940, the route mileage in the continental United States stood at 37,512, an increase of almost 1,400 percent in 15 years. These routes, serving approximately 250 scheduled air-line stops, are shown on Fig. 16. (Territorial routes in Hawaii and Alaska are included in Figs. 17 and 18.)

In 1926 foreign routes operated by United States air carriers consisted of two very short lines—one between Seattle and Victoria, and the other between New Orleans and Pilottown, a total of 152 miles. The first real expansion of our foreign air-line network occurred in 1929, when some 10,000 miles of routes were opened to the West Indies, Central America, the Canal Zone, the entire West Coast of South America, and to Buenos Aires. Further extension of routes in Latin America almost doubled this mileage in 1930.

Five years later the trans-Pacific service was inaugurated by way of Honolulu and Manila. This brought total foreign air-mail route mileage operated by United States carriers up to 32,184 in 1935, from which time there have been more miles of foreign than domestic routes. Scheduled air transportation across the North Atlantic was finally begun by Pan American Airways in 1939; 1940 saw the opening of air routes from Seattle to Alaska and from Honolulu across the South Pacific to New Zealand, bringing the total route mileage up to approximately 46,000.[8]

The present foreign air-line network is shown on Figs. 19 and 20. In the short space of 14 years the international air transportation system operated by

[8] Does not include American-owned locally operated routes in China, Central America, Mexico, Cuba, Colombia, and Brazil.

AIR ROUTES IN ALASKA, NOVEMBER 1940

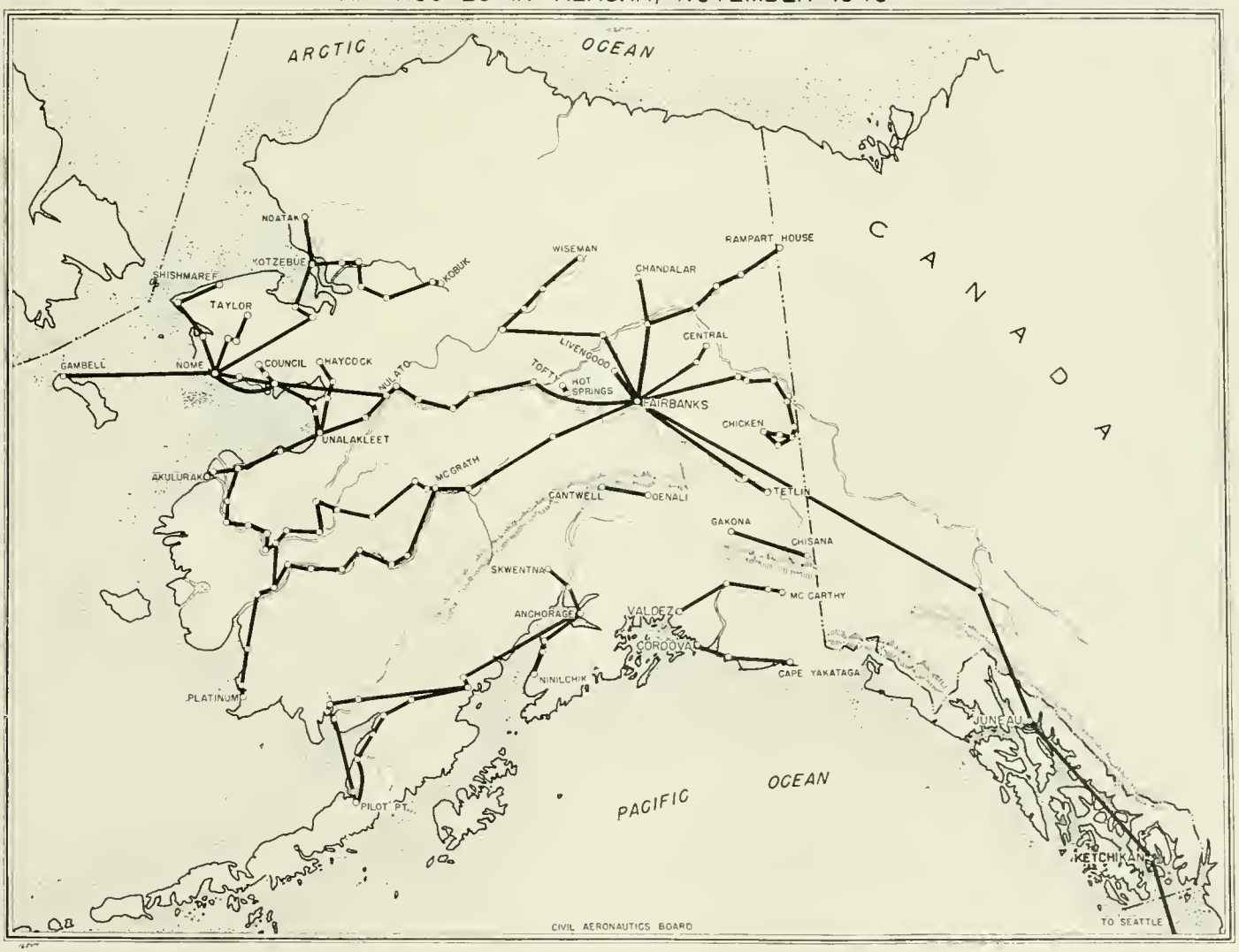


FIGURE 18

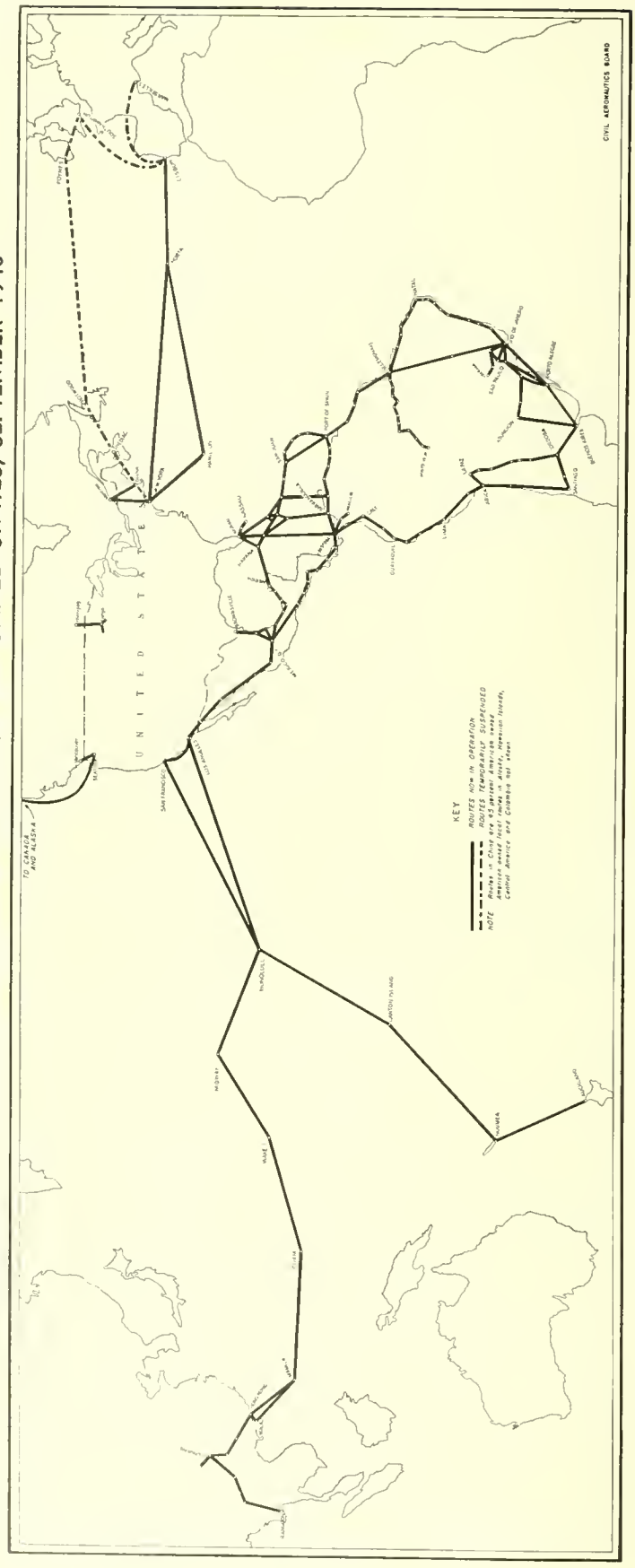


FIGURE 19

United States carriers has grown from a tiny shuttle service to a great network spanning two oceans and linking five continents.

Mileage and Traffic

Miles flown on domestic routes have increased in every year but one, from 4,259,000 in 1926 to 94,768,000 for the fiscal year 1940. The increase in the number of miles flown has been more rapid than the increase in route mileage, especially in the recent past. Miles flown on foreign routes have also shown a rapid growth, but due to the less frequent schedules they have always been only a small fraction of domestic mileage. In 1938, for example, revenue miles flown per miles of route on domestic schedules were about seven times higher than on foreign routes.

Passengers and mail have constituted in the past the two principal types of air traffic. Since 1934, domestic mail pound-miles have increased some 400 percent: and over 600 percent in the case of the foreign routes. The aggregate volume of mail on domestic routes is, of course, heavier than that on the foreign system, being some nine times greater in 1940.

The decrease in domestic mail traffic in 1933–34 was due in part to air-mail contract cancellations in 1934, and in part to an increase in the air-mail charge from 5 cents to 8 cents in July 1932. The present rate of 6 cents an ounce was established July 1, 1934.

Since 1937 there has been no increase in the number of pound-miles of mail carried per mile flown. The average mail load per trip has declined slightly since 1937, while the total pound-miles carried has increased approximately 50 percent.

The carriage of passengers on any serious scale was not attempted by the first mail contractors. If passengers were received at all, they wedged themselves in among the mail sacks in small open cockpit airplanes. For an uncertain expedition and the privilege of enduring this discomfort, the average charge was 12 cents a passenger-mile. It is little wonder the public did not take very enthusiastically to flying. In 1926 fewer than 6,000 passengers flow on scheduled air lines in the entire United States.

In Europe, on the other hand, passenger travel was encouraged and as early as 1924 over 60,000 were carried. Between London and Paris, one of the most popular routes abroad,

ROUTES OF AEROVIAS NACIONALES DE COLOMBIA (AVIANCA), SEPTEMBER 1940

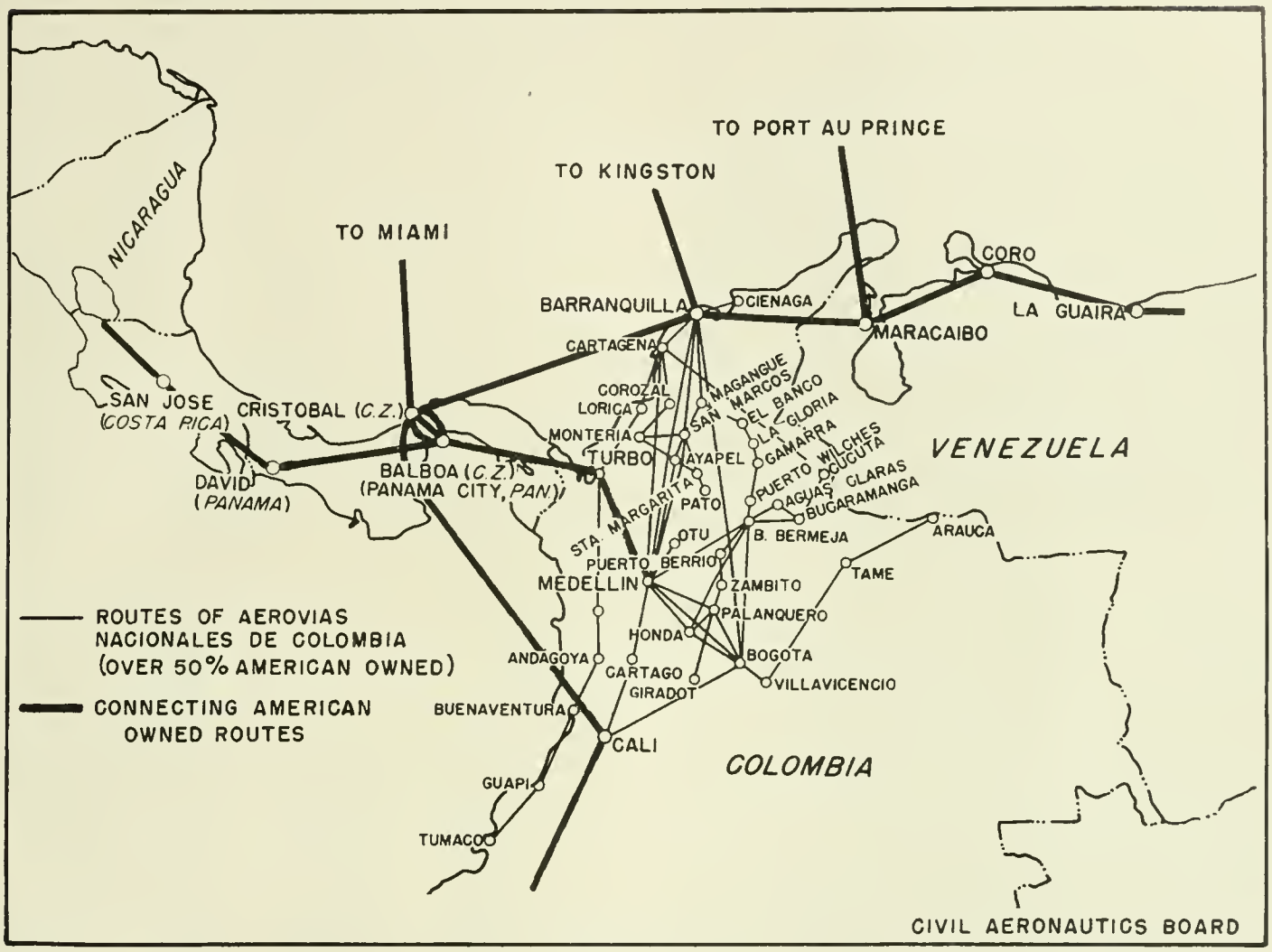


FIGURE 20

there were more American air passengers than any other nationality.

Events of 1927–29 contributed to a rapid change in the local situation. A premature boom in aviation investments brought into existence some 44 scheduled operators by 1929, almost three times as many as there are today. Many of these companies had no mail contracts and turned to passengers for their traffic.

Meanwhile, much improvement had been made in aircraft equipment, and by the winter of 1928 most of the mail-carrying lines were operating planes with closed cabins for at least four passengers. Even at this late date, however, passengers were not being carried regularly between New York and Chicago, now one of the most heavily traveled routes in the country.

The Wall Street collapse of 1929 brought disaster to many of the airlines and led to the passage of the Watres Act in 1930. Under this act the Government for the first time undertook to encourage the development of passenger traffic by varying mail payments in accordance with the provision by the operator of various facilities for passenger comfort, safety, and expedition. Largely as a result of this legislation, the number of passengers on domestic air routes increased from 160,000 in 1929 to 375,000 in 1930, and has continued to increase steadily in every subsequent year but one. By 1940 the domestic airlines were carrying over 2,000,000 passengers per annum.

Revenue passenger-miles are a better criterion of growth than the number of passengers, as the latter are reported separately by each carrier and the total thus includes considerable duplication. Domestic pas-

senger-miles have increased over 1,000 percent since 1930. During the past 4 years passenger-mileage has more than doubled, the largest gains occurring in the last 2 years.

Physical Plant

Surprisingly little equipment is required to operate the air transportation system. On June 30, 1940, there were only 322 transport planes in use by domestic air carriers and 108 planes on foreign routes. During the past 10 years there has been very little change in the total number of planes employed on foreign services. On domestic routes, however, the transport fleet steadily declined from 497 in 1930 to 253 in 1938. During this period the number of seats available per plane in domestic service increased from less than 6 to more than 15, while the miles flown per plane more than tripled. It will be noted that transport equipment on domestic routes is utilized on the average some 3 times more intensively than aircraft serving the foreign lines.

Airports in the United States more than doubled between 1927 and 1932, since when they have remained more-or-less stationary at something over 2,000. This includes airports of all types, the great proportion of which are inadequate for large transport plane operation. The number of private airports reached its maximum in 1933 and has declined sharply since that date, being exceeded since 1934 by the number of municipal fields. (See footnote 11.)

The tremendous expansion in both scheduled air transportation and private flying has rendered present landing facilities increasingly inadequate. During the summer of 1940, for example, at several of the busiest airports in the country, the average number of plane arrivals and departures was about one per minute every day in the week.[9] Recognizing both the civil and national-defense aspects involved, Congress in October 1940, appropriated $40,000,000 to initiate a long-range project for the construction or improvement of landing facilities. The program as sponsored by the Department of Commerce calls for an ultimate of some 4,000 fields, increasing the number of first-class, all-weather all-purpose airports from 36 to 500 and medium-size airports from 245 to 1,600.

Airway facilities in the United States are almost wholly sponsored by the Government. These consist principally of revolving beacon lights, radio range and broadcast stations, weather teletype service, and emergency fields.

Virtually all these airway communication and lighting facilities in the United States are owned and operated by the Civil Aeronautics Administration and the Weather Bureau (or in some instances by the Army or Navy). On our foreign routes, on the other hand, the carriers themselves must assume a large proportion of the burden of establishing and maintaining such facilities.

Between 1929 and 1939 the number of radio broadcast stations was almost tripled. In 1939 there were 244 radio range beacon stations, as compared with only 9 in 1929. During this period the number of weather stations serving air transportation has been increased 6-fold and the number of miles of airways lighted by the Civil Aeronautics Administration has been more than doubled. In 1925 only one-half the route mileage of the domestic routes of scheduled air carriers was lighted. By 1939 the lighted proportion had increased to 74 percent.

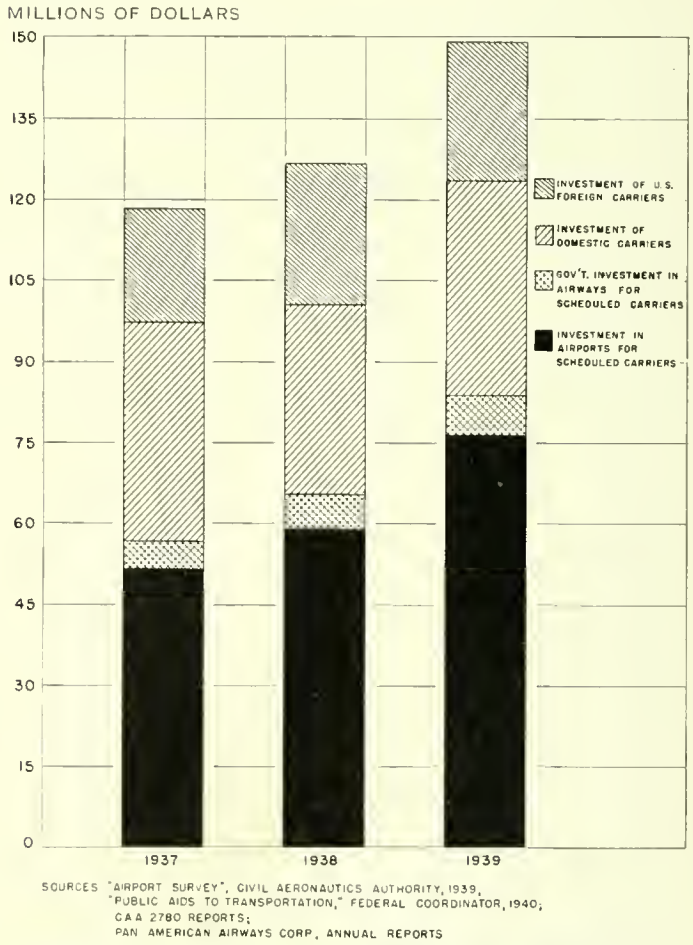


FIGURE 21.—Estimated U. S. Investment in Scheduled Air Transportation, 1937–39

[9] At the Oakland Airport, for example, during the week ending September 14, 1940, there were some 17,000 plane arrivals or departures. This represents nearly 2 a minute every 24 hours and is due in part to the presence at the airport of a pilot training school. At La Guardia Airport, New York, on the other hand, where flying is largely restricted to scheduled air carrier operations, the average number of plane arrivals and departures is about 2,000 per week, or 1 every 5 minutes.

Personnel

Between 1931 and 1940 the total number of persons employed in air transportation increased from 5,667 to almost 20,000. In 1931 the airlines employed less than 10 people for each airplane operated. By 1940, the average was 46 employees per plane. The number of employees, however, has increased much less rapidly than the volume of passenger business.

Fifteen percent of the airline employees in 1940 were flight personnel, 45 percent maintenance and airport personnel, 40 percent traffic and administrative. Of the 2,955 flight employees in 1940, 2,076 were pilots or copilots and the remaining 879 were hostesses or stewards. The number of pilots and copilots employed by the airlines has increased 369 percent since 1929. Approximately 70 percent of the total airline personnel is in the employ of the domestic carriers and 30 percent is employed by the foreign-route operators.

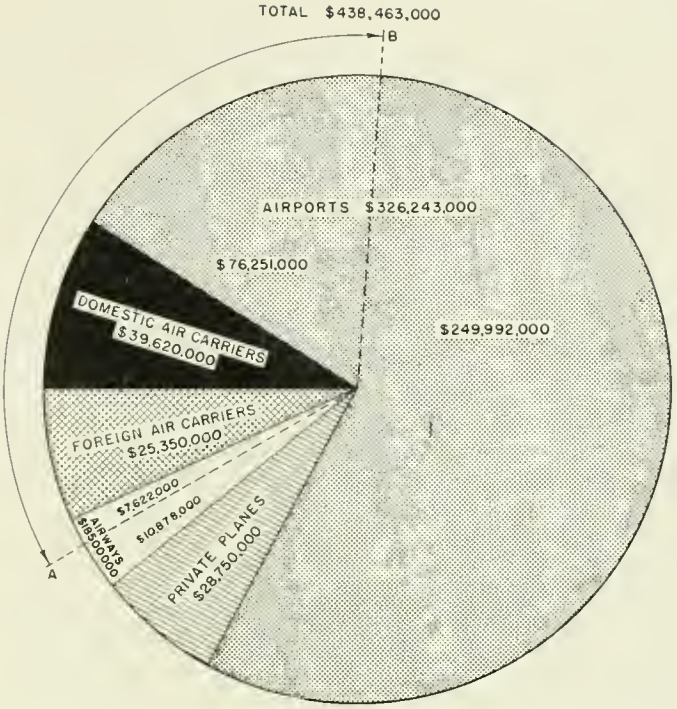
The Federal airways system operated by the Civil Aeronautics Administration employs an airways personnel of approximately 3,000 of whom perhaps 1,500 are assignable to scheduled operations. Others whose services should be allocated in whole or in part to air carrier operation are employees of the private and municipal airports serving as scheduled airline stops. No data on this latter group are available, but probably the number of airport personnel so chargeable would not exceed 1,000. Thus the total number of persons directly employed in scheduled air transportation approximated 22,500 in 1940.

Investment

From 1937 to 1940 foreign carriers' assets increased approximately 44 percent, from $21,000,000 to $30,000,000. Domestic carriers' investment declined somewhat in 1938 and 1939, but by 1940 total assets approximated $60,000,000, or about double the investment of the foreign route operators.

For the complete picture of capital represented by the airline industry, we must add the proportion of investments in airports and airways assignable to scheduled air transportation. Of a total of $326,000,000 in airports in 1939, approximately two-thirds was invested in airports used by scheduled carriers. These airports constitute less than one-tenth of the total number in the country.

Thirty-six percent of the $212,000,000 invested in these airports is assignable to the operations of the carriers themselves.[10] The remaining 64 percent of



A–B, PROPORTION ASSIGNABLE TO SCHEDULED AIR CARRIERS—$148,843,000.

SOURCES: "AIRPORT SURVEY", CIVIL AERONAUTICS AUTHORITY, 1939; "PUBLIC AIDS TO TRANSPORTATION", FEDERAL COORDINATOR, 1940; CAA 2780 REPORTS, 1939; PAN AMERICAN AIRWAYS CORP., ANNUAL REPORT, 1938

FIGURE 22.—Estimated U. S. Investment in Scheduled and Non-Scheduled Air Transportation, 1939

this investment is assignable to nonscheduled flying. Thus, of the total amount invested in all airports, some 23 percent, or $73,000,000, is assignable to scheduled air carrier operations.[11]

The Federal Government's capital expenditures for airway lighting and communication facilities stood at

[10] See Federal Coordinator of Transportation, *Public Aids to Transportation*, vol. 1, pp. 152–4. Allocation is on the basis of relative number of aircraft landings and passengers carried during 1935–39 by scheduled operators, as compared with total flying by all types of aircraft. (Based on current operations alone, the proportion allocated to scheduled services might be substantially changed, due to the great increase in private flying and to increased use of civil airports and airways by the military services.)

[11] The average investment in airports used by air carriers was $1,028,000 at the end of 1938. For the group of nine airports with the largest traffic, the total investment at the end of 1937 was over $51,000,000, and the average investment per airport was $5,700,000, with a range from a minimum of $1,500,000 to a maximum of $10,750,000.

In recent years the increase in the size of aircraft equipment and in the number of schedules flown has necessitated a substantial increase in the size and development of the airports used in scheduled operations. Between 1936 and 1938 the average investment in these airports increased 47 percent. The total capital investment in this group (206 airports) increased by 49 percent during the years 1938 and 1939, while the total investment in fields not having air transport service increased only 28 percent. Much of this expansion was made possible by the policy of the Works Progress Administration, which, together with its predecessor organizations, the C. W. A. and the F. E. R. A., expended approximately $170,000,000 on civil airports during the fiscal years 1934–40. (See Airport Survey, Civil Aeronautics Authority, 1939, p. 13. Figures for 1939–40 from W. P. A.)

Of the total airport investment of $326,000,000 in 1939, one-fourth represented private funds. The remaining 75 percent was distributed as follows: Municipalities, 40 percent; Federal Government, 33 percent; State governments, 2 percent.

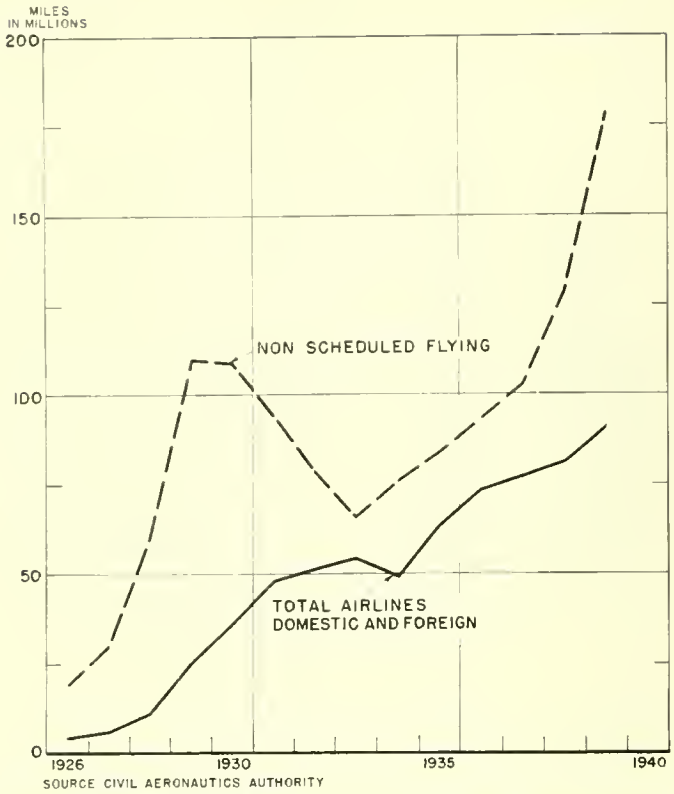


FIGURE 23.—Miles Flown, U. S. Airlines and Non-Scheduled Flying, 1926–1939

approximately $18,500,000 in 1939, a 100 percent increase over 1933. Of this, some $7,622,000 is chargeable to scheduled services.[12]

The resulting total investment in scheduled operations is roughly $150,000,000 (Fig. 21), of which the carriers' own investment accounts for 45 percent, the Federal Government's apportioned investment in airways for 5 percent, and airports for 50 percent.

The global investment in both scheduled and nonscheduled flying in 1939 was about $438,000,000, three-fourths of which was in airports and one-third of which was assignable to scheduled air transportation (Fig. 22).

Nonscheduled Flying

It is not generally realized that in some respects nonscheduled flying[13] accounts for the greater part of civil aviation activities in the United States. In 1928 the number of miles flown in private and commercial operations was six times greater than that of the scheduled carriers (Fig. 23). During the depression, nonscheduled flying declined sharply and not until 2 years ago did it exceed the boom figure reached in 1929.

Although nonscheduled flying has not grown as rapidly or as steadily as scheduled service, it still accounted for twice as many miles flown as the airline carriers in 1939. The 12,000 planes involved, however, only flew about 14,000 miles each on the average, compared with 312,000 miles per plane for the big airliners.

A useful criterion for comparing the two types of flying is the relative amount of fuel consumed: In the last 10 years scheduled carriers have used more gasoline each year, consuming in 1939 56 million gallons against 16 millions in nonscheduled operations (table 2).

The Civilian Pilot Training Program of the Civil Aeronautics Administration, begun in 1939, will doubtless give a great impetus to private flying in the near future. On June 30, 1940, there were 41,000 certificated airplane pilots (of all classes), and 10,000 aviation mechanics in the United States (Fig. 24).

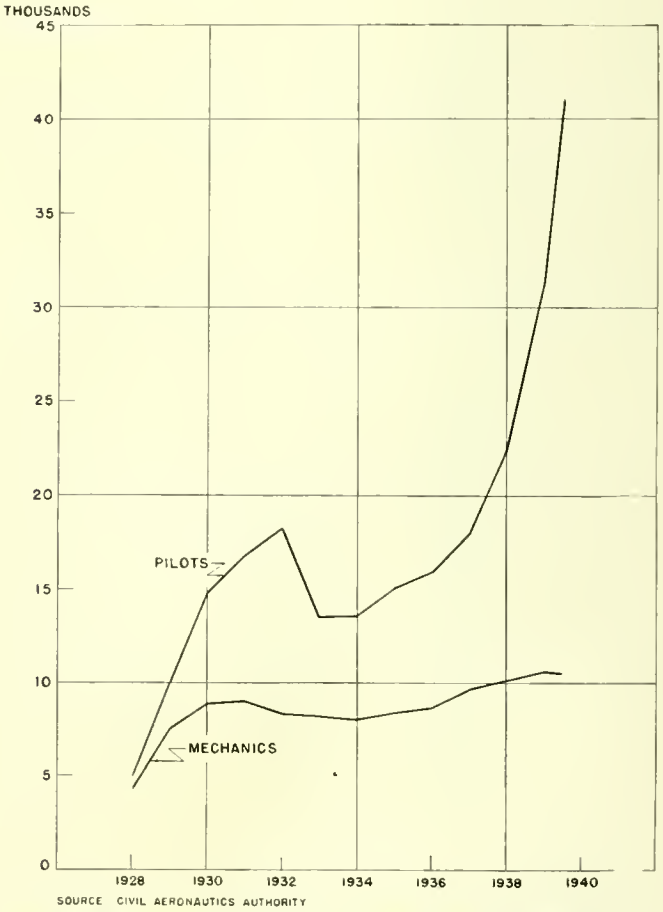


FIGURE 24.—Number of Certified Airplane Pilots and Mechanics, 1928–1940

[12] *Ibid.* (footnote 10). Allocation is on the basis of relative number of plane-miles flown in scheduled and nonscheduled civil operations. In addition to this investment, the Federal Government now expends in excess of $10,000,000 per annum for the maintenance and operation of the airways.

[13] "Nonscheduled flying" includes commercial flying (charter services, sightseeing, etc.), business flying done in company planes, and private flying done for business or pleasure.

During the fiscal year 1941, 48,000 additional students are expected to complete the training courses. This represents as much pilot training as has been done in the United States by all private sources in all the years since the Wright brothers invented the airplane,[14] and will shortly double the number of certificated pilots in the country. The effects of the civilian pilot training program are already evident in a sharp increase in the production of small airplanes and in the volume of private flying.

[14] See statement of Robert H. Hinckley, Assistant Secretary, Department of Commerce, *Civil Aeronautics Journal, September 15, 1940.*

TABLE 2.—*Number of Planes and Miles Flown, Domestic Airlines and Nonscheduled Flying, 1939*

Type of flying	Number of planes (Dec. 31)	Thousands of miles flown
Domestic air lines	265	82,572
Nonscheduled flying	12,247	177,868

Source: Civil Aeronautics Authority.

ECONOMIC CHARACTERISTICS OF SCHEDULED AIR TRANSPORTATION

General Aspects

Organization

Sixteen private air-line companies comprise the bulk of the domestic air transportation system.[15] Of these, the four largest in 1940 carried four-fifths of the total cargo of passengers, mail, and express, one company alone accounting for 30 percent. The six smallest operators together handled only 2.5 percent of the gross traffic (Fig. 25).

United States foreign routes (with the exception of some domestic extensions across the border into Canada) are all presently operated by the several subsidiaries of one company, the Pan American Airways Corporation. Another company, American Export Airlines, Inc., which has recently undertaken to acquire the T. A. C. A. air-line system in Central America, has been granted a certificate of convenience and necessity by the Civil Aeronautics Board for a trans-Atlantic route.[16]

Under existing law no air carrier may engage in interstate, overseas, or foreign air transportation without first obtaining a certificate of convenience and necessity for the services contemplated and a finding that it is fit, willing, and able to perform such transportation properly.[17]

The financial structure of the air-carrier industry contrasts sharply with that of most rail transport companies: As shown by table 3, less than 10 percent of the combined air-line capital is in funded debt, and less than 50 percent of total assets is in fixed assets (plant, equipment and land).

[15] Inter-Island Airways, Ltd., which operates locally in the Hawaiian Islands, is included as a domestic air carrier. Not included are some small nonmail carriers, such as the Catalina Air Transport between Los Angeles, Wilmington, and Santa Catalina Island. The 16 domestic air-mail carriers are those which qualified under the so-called grandfather clause of the 1938 Civil Aeronautics Act. Mergers, consolidations, depression, and air-mail cancelation brought about this reduction in the number of independent operators. (See pp. 11 and 14, *supra.*)

[16] Two domestic carriers have also filed applications for extensions into Mexico and Cuba.

[17] Civil Aeronautics Act of 1938, secs. 401, 402.

TABLE 3.—*Financial Structure of the Airlines*

[In thousands of dollars]

	Domestic (as of June 30, 1940)	Foreign (as of Dec. 31, 1939)
Funded debt	$4,439	$2,115
Preferred stock	565	
Common stock	21,321	7,393
Surplus reserves	64	1,681
Capital surplus	20,241	10,458
Earned surplus	−884	1,715
	45,746	23,362
Net worth	41,307	21,247
Total assets	60,405	30,355
Fixed assets in percent of total assets	45.3	48.6

Traffic, Revenues, and Expenses

Of the three principal types of air traffic, passengers are of overwhelming importance from the standpoint of ton-miles of service flown. If the average weight of a passenger plus forty pounds of free baggage is taken at 200 pounds, domestic passenger traffic amounted to almost 90 percent of a total of about 100 million ton-miles transported during the fiscal year 1940 (Fig. 26). Passenger business has grown much more rapidly than either mail or express.

Domestic mail traffic, which represented some 10 percent of the total volume in 1940, produced about 29 percent of the operating revenue (table 4). On the foreign routes, however, mail revenues for the past several years have constituted over half of the carriers' income.

In 1939, for the first time gross revenues of domestic carriers exceeded operating costs. The foreign carriers, although earning relatively less nonmail revenue, received Government compensation sufficient to assure them a profit in every year since 1931.

All of the foreign carriers and most of the domestic carriers still depend for their profits on generous rates of compensation for the carriage of mail. Some of the larger domestic operators, however, would have earned a profit in the fiscal year 1940 with a flat mail-haulage fee less than half a mill per pound-mile. The average

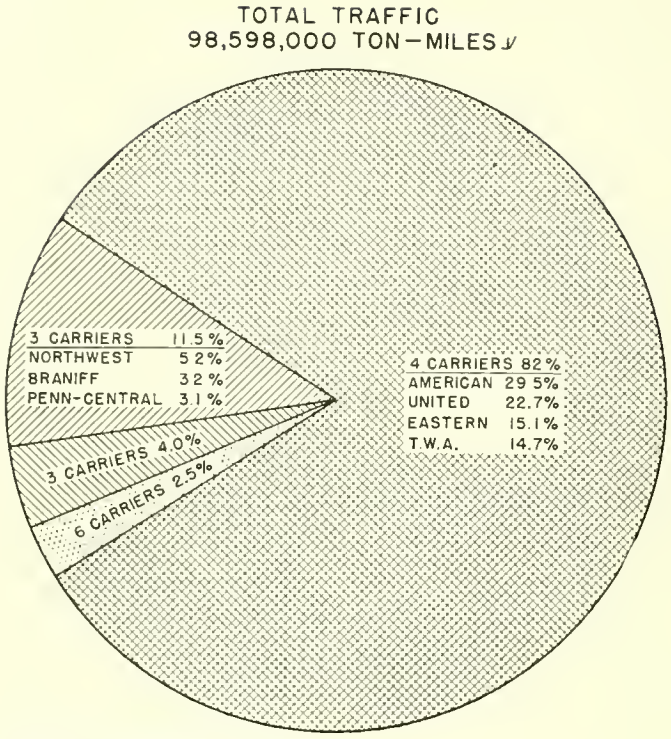


FIGURE 25.—Distribution of Traffic Among the 16 Domestic Air Carriers, Fiscal Year 1940

mail revenue in that year for all domestic air-mail carriers was 0.982 mill per gross mail-pound mile.[18]

Total domestic revenues from all sources were approximately $65,000,000 in the fiscal year 1940, an increase of 183 percent over 1935. Total revenues on the foreign routes were $20,000,000 in the calendar year 1939, an increase of 112 percent in the 5 years.

The distribution of the average domestic air carrier revenue dollar for the fiscal year 1939 is shown in Fig. 27. Forty cents of each dollar received went to salaries and wages; fuel took 9.4 cents; insurance, depreciation, and other expenses accounted for 45 cents, leaving 2.1 cents per dollar of income for net operating profit. The profit trend in 1940, however, was sharply upward, net operating income representing almost 10 cents out of every dollar earned. For the fiscal year 1940 the average rate of capital turnover, or ratio of total revenues from all sources, to the average of investment at the beginning and end of the fiscal year, for domestic air-mail carriers, was 1.86.

Unit Charges and Revenues

Passenger rates which in 1929 were 12 cents per mile were sharply reduced during the next few years to less than 6 cents. Since 1932, however, the decrease has been very gradual (Fig. 28). There is considerable variation in unit fares among the domestic carriers and over different routes, the average ranging from 4 to 6 cents per revenue passenger-mile.[19] On foreign routes passenger fares average about double domestic rates, or approximately 10 cents per mile.

TABLE 4.—*Distribution of Traffic and Revenues, Domestic Air Carriers, Fiscal Year, 1940*

Type of traffic	Pound miles	Revenues [1]
	Percent	*Percent*
Total	100.0	100.0
Express	3.0	2.8
Mail	9.6	28.9
Passenger	87.4	68.3

Source: Civil Aeronautics Authority (2780 Reports).

[1] Miscellaneous revenues not included.

Domestic air express rates have changed little in recent years, averaging over 80 cents per ton-mile, or some 60 percent higher than equivalent passenger fares. As will be noted later, these relatively high express charges have acted as a serious deterrent to the development of commodity traffic volume.

Government compensation to domestic carriers for the transportation of mail, while decreasing some 50 percent in the last 10 years to 1.2 mills per pound-mile, still averages about 5 times the equivalent passenger rate.[20]

Since Government mail contracts have been awarded on a plane-mile basis for a minimum of 300 pounds of mail (including containers), the equivalent pound-mile rate varies widely among the various routes. On certain trunk lines it averaged well under a mill, and up to as high as 17.9 mills per gross pound-mile on routes where average air-mail loads were very light.

On United States operated foreign routes the rate of mail compensation has been declining steadily, but in 1940 was still some 4.5 to 5 times higher than on domestic routes.

In the last 5 years Post Office revenues from domestic air mail have approximated payments to the carriers.[21] Including Post Office expenditures other than transportation, apportioned to the air mail service, however,

[18] See Civil Aeronautics Board, *Annual Airline Statistics, Domestic Carriers, Fiscal Years 1935–1940*, Table 1. See also footnote 20.

[19] Computing passengers plus baggage at 200 lbs. each, the average passenger rate in 1940 was 0.255 mill per pound-mile, equivalent to 51 cents per ton-mile, 5.1 cents per passenger-mile. On the Hawaiian air line the average fare was 10.6 cents per passenger-mile.

[20] This is on a net-weight basis, excluding weight of mail containers.

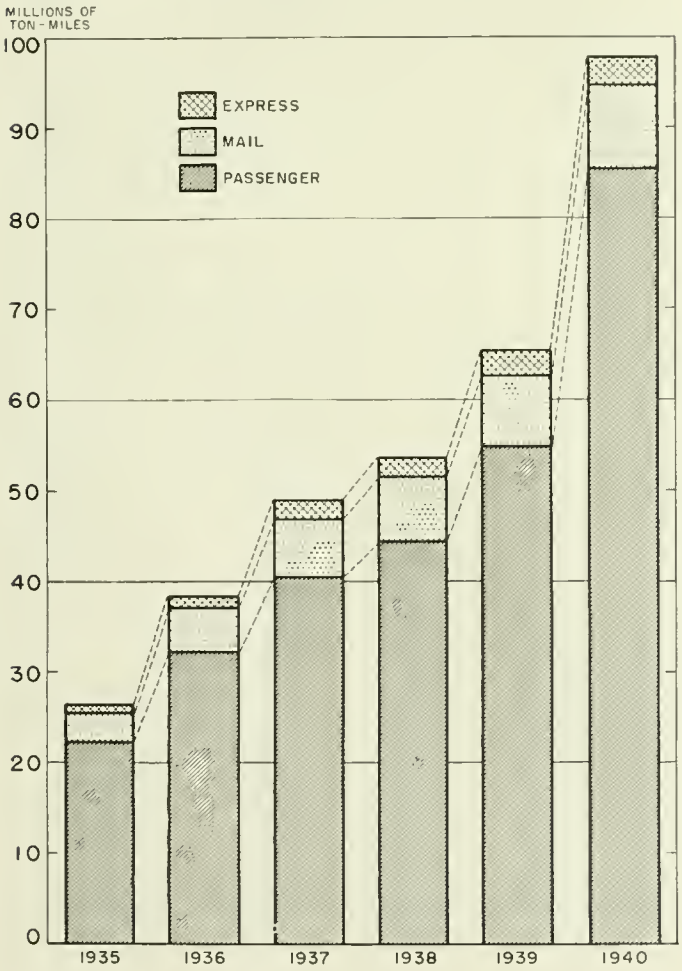
[21] See 227 I. C. C. 498 (1938). Including the weight of air-mail containers, the average revenue to the Post Office for the fiscal year 1939 was 1.032 mills per pound-mile, while average payments to the air carrier were 1.054 mills per pound mile. Giving credit for the transit-haulage over domestic routes of foreign air mail (on an equal pound-mile basis with domestic mail), the average revenue is 1.114 mills per gross pound-mile. See also *Annual Report of the Postmaster General, Fiscal Year 1940*, Tables 49, 51.

gross income on domestic air mail in 1940 was about 65 percent of gross postal expense; and for foreign air mail, 45 percent (Fig. 29).

An estimate of the potential importance of each of the three principal types of traffic and the problems peculiar to each is undertaken in subsequent sections of this report, following a discussion of operating costs.

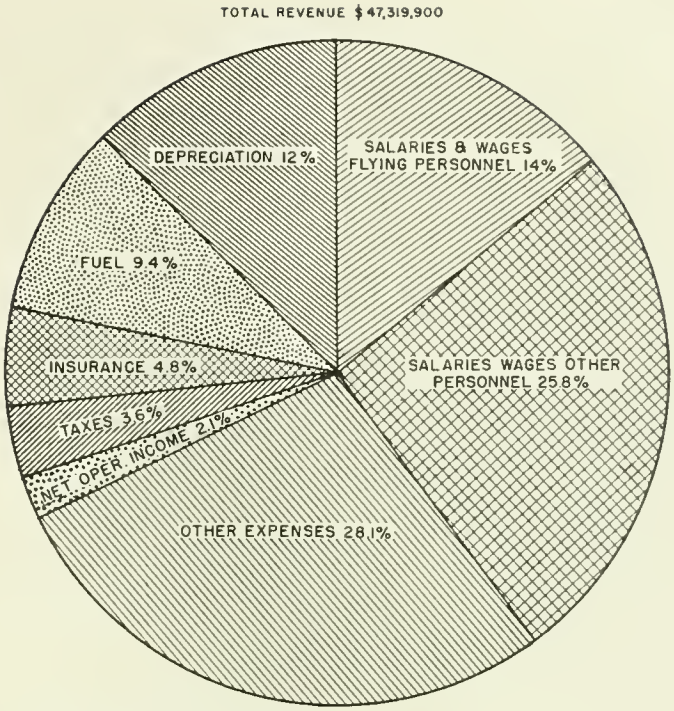
Liability and Insurance

The liability of air carriers to their passengers is the same, in general, as that which railroad and motorbus operators owe to their clients. It is recognized by the courts that passengers, whether journeying by railroad, by bus, or by aircraft, necessarily assume certain risks incident to travel, and that therefore the carrier is not an insurer of the safety of its passengers. Where litigation does arise, the primary issues are whether the operator exercised the degree of care required by the law under the particular circumstances and whether the negligence of the operator, if so found, was the proximate cause of the passenger's injury.



SOURCE: CIVIL AERONAUTICS AUTHORITY

FIGURE 26.—Passenger, Mail and Express Ton-Miles Carried by Domestic Air Carriers, F. Y. 1935–1940



SOURCE: CIVIL AERONAUTICS AUTHORITY

FIGURE 27.—Distribution of the Domestic Air Carrier Dollar Fiscal Year 1939

On December 31, 1939, all aircraft employed by the scheduled air lines were covered by passenger liability, public liability, and property damage insurance.[22] The limits most commonly carried for passenger liability were $1,000,000 per aircraft per accident, and $75,000 for any one passenger. With respect to public liability, the general limit carried was $50,000 per person and $100,000 per accident; and for property damage insurance, $50,000.

Passenger liability insurance is written for the scheduled air carriers at a rate based upon passenger-miles or passenger-hours flown by the carrier. Public liability and property damage insurance are generally written upon a rate based upon aircraft-miles flown.

The average premium paid by domestic carriers in 1939 was 1.33 mills per passenger-mile for passenger liability insurance and 1.15 mills per plane-mile for public liability and property damage insurance. The total premium paid by domestic air carriers during 1939 for these primary liability policies was in excess of a million dollars.

Rates for aircraft liability insurance have been decreasing annually in recent years. Thus, passenger liability premiums in 1939 averaged 4.4 percent less

[22] Data in this and subsequent paragraphs have been abstracted from a comprehensive "Study of Proposed Aviation Liability Legislation," under preparation by Edward C. Sweeney for the Civil Aeronautics Board.

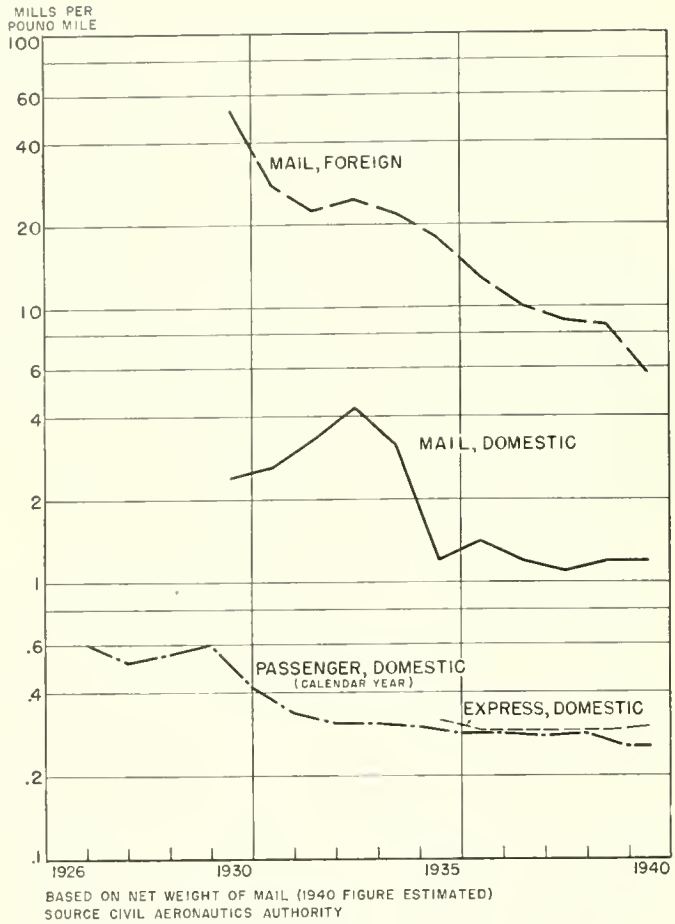


FIGURE 28.—U. S. Air Carrier Unit Revenues, 1926–1940

per passenger-mile than in 1938; while public liability and property damage premiums averaged 2.1 percent less per plane-mile in 1939 than in 1938.

During the 5-year period 1934–38, insurance companies paid out in settlements and satisfaction of judgments for passenger fatalities the sum of $1,385,862, representing 124 claims, for an average of $11,144 per fatality; for severe injuries to passengers, the sum of $434,074, involving 48 claims and averaging $9,043.

Public liability claims in connection with scheduled air-carrier operations during the same 5-year period were trivial, there being only one third-party fatality, which resulted in a judgment for the plaintiff amounting to $1,750. The remaining 19 claims were for minor injuries which were all voluntarily settled for an average of $140 per claim, except one which was taken to court and terminated with a judgment for the defense. Seventy-six minor property-damage claims during the 5 years in question were settled by payments averaging $229.

As regards aircraft in nonscheduled and private operation, it is estimated that on December 31, 1939, between 5 and 6 percent were insured against passenger liability, some 10 percent against property damage, and approximately 11 percent against public liability.

Operating Costs

Cost Per Passenger Seat-Mile

Air transport operation expenses may be divided appropriately into three general classes:

(*a*) Those which vary primarily with the volume of flying and type of equipment;

(*b*) Those which vary with the volume and nature of traffic handled; and finally,

(*c*) The overhead and general administrative costs which are relatively little affected by moderate changes in either the volume of flying done or service rendered.

The first class are often referred to as the significant, or direct, costs. They vary with the airplane's size, initial cost, areodynamic efficiency, as well as with the general-operating character and efficiency of the carrier, the intensity of use of equipment, cost of fuel, pilots' and crews' salaries and expenses, practice with regard to depreciation, insurance, and maintenance, and similar items.

For a 21-passenger DC 3 employed 2,000 flying hours per year and wholly depreciated in 6 years (engines in 5,000 flying hours), these direct costs, excluding any interest on investment, amount to about 35 cents per revenue mile in current domestic operations. For a

POST OFFICE DEPT. REVENUES AND EXPENDITURES FOR AIR MAIL, FISCAL YEARS 1930-39

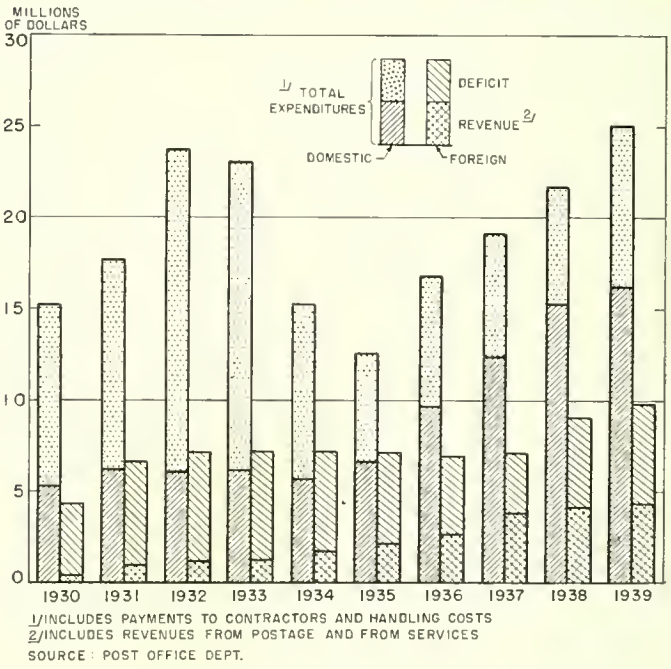


FIGURE 29

40-passenger DC 4 cruising some 30 miles an hour faster (220 m. p. h.), the significant cost computed on the same basis should approximate about 66 cents a mile.[23]

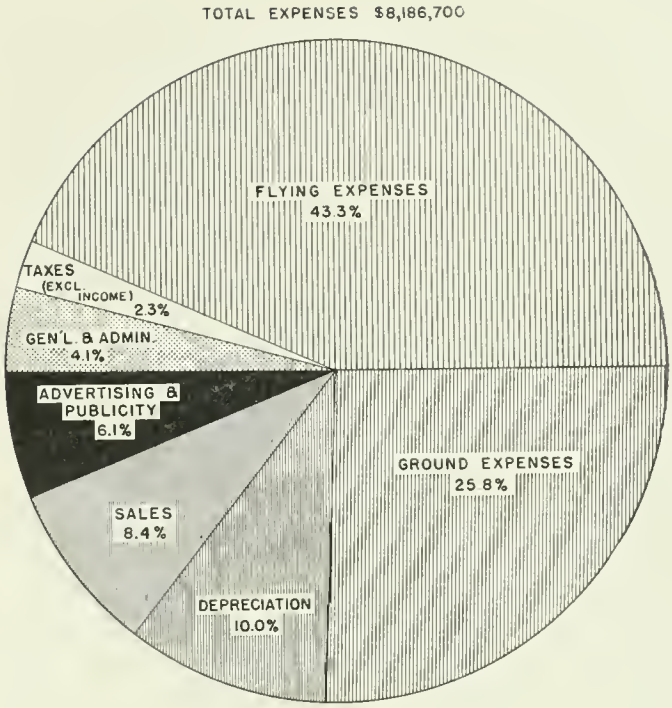
Intensity of use of equipment has a profound effect on significant costs. Double the utilization assumed above would reduce the direct cost for the DC 4 to the neighborhood of 55 cents per mile. The same favorable trend would result from a lowered initial cost, improved aerodynamic efficiency, or an extension of the operating life of equipment, both planes and engines. Obsolescence is still the primary cause for rapid plane write-off, rather than actual depreciation.

Thus, the direct costs are now less than 2 cents per passenger seat-mile available on a number of domestic airlines, and are rapidly trending toward 1.5 cents. It is probable that the significant cost will approach 1 cent per passenger seat-mile within a reasonable future (even without allocating any costs to other than passenger traffic). This, of course, is on a capacity-operation basis. The cost per passenger seat-mile occupied will be greater in proportion as the load factor is less than 100 percent.

Costs which vary primarily with the number of passengers aboard presently average somewhat less than half a cent per revenue passenger-mile. These are items which remain fairly constant per passenger regardless of the equipment operated. A change in present air carrier practice as, for example, the elimination of free meals aloft would effect substantial savings in this category.

The third type of expense, that relatively unaffected by moderate change in volume of service offered or sold, cannot be allocated on a per-mile or per-passenger seat-mile basis, except more or less arbitrarily. On a strictly additional-cost basis only the first two classifications would need to be considered. Thus, omitting the third group for the moment, an expense trending toward 1.5 cents per passenger seat-mile available is indicated.

The question of overhead may be examined in terms of one of the major domestic air carriers—American Airlines—which in the last fiscal year performed some



SOURCE: AMERICAN AIRLINES.

FIGURE 30.—Distribution of Operating Expenses, American Airlines, Inc., Six Months Ended June 30, 1940

30 million ton-miles of revenue service. As shown in Fig. 30, sales, advertising and publicity, taxes (excluding income tax), and general and administrative expenses together amounted to about 20 percent of the total operating cost. Hence, including overhead, a gross expense in the neighborhood of 2 cents per capacity-seat-mile may be anticipated within a reasonable future.

There has been a rising trend during the past 5 years in the cost per airplane-mile, reflecting the increased size and power of transport equipment presently employed. Introduction of four-engine equipment on major transcontinental routes and the replacement of the 10–14 passenger planes on smaller lines with bigger equipment is certain to accentuate this tendency.[24]

Cost Per Capacity Ton-Mile

Comparison on a plane-mile basis is not very helpful because a "plane-mile" is no more a definite unit of service than a piece of string is a unit of length. A better criterion is the cost per pay-load unit of service offered or rendered. The most satisfactory common

[23] See significant operating cost equations developed in detail by W. C. Mentzer and Hal E. Nourse, of United Air Lines Transport Corporation, in the *Journal of the Aeronautical Sciences*, April and May 1940, "Some Economic Aspects of Transport Airplane Performance."

The principal expenses which are assumed to vary with plane-miles flown are those for engine and aircraft repairs, fuel, salaries and expenses of flight crews, public-liability and property-damage insurance, and engine depreciation. Those varying with revenue passenger-miles flown include passenger-liability insurance, passenger supplies and food service expense, commissions on passenger tickets sold, and reservation communications expense. Fixed expenses are generally taken to include plane depreciation, a portion of indirect flying expense, traffic and advertising, and general and administration expense.

No attempt is made here to include an allocation of costs arising from public aid conferred through the provision of airways, airports, and other facilities.

[24] Thus the average operating expense per revenue mile on Continental Airlines, operating between Denver and El Paso, using Lockheed 12–A and 10-passenger Electras, was 39.7 cents for the fiscal year 1940. The average for all domestic air-mail carriers for the same period was 61.8 cents. By contrast, the gross operating expenses for the four-motored Boeing Stratoliner and the Douglas DC 4 are likely to be over $1.00 per plane-mile.

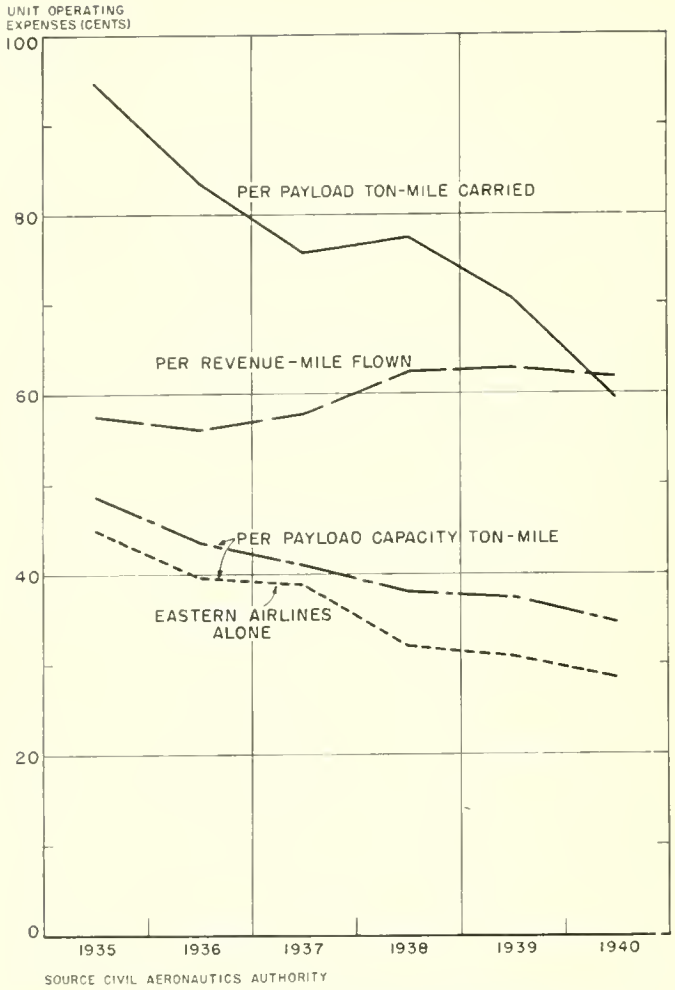


FIGURE 31.—Average Unit Operating Expenses of the 16 Domestic Air Carriers, Fiscal Years 1935–1940

denominator for this purpose, although admittedly not perfect, is the pay-load ton-mile.

Figure 31 indicates a marked downward trend per pay-load ton-mile carried, from 95 cents in 1935 to 59.5 cents in 1940. This improvement reflects both an increase in load factor, as well as a substantial decrease in basic unit cost.

The steady reduction in this latter factor is shown by the lower lines in the chart. The average gross operating expense per pay-load capacity-ton-mile has decreased from approximately 50 cents in 1935 to less than 35 cents in 1940. Eastern Air Lines, one of the lowest cost operators, shows a unit expense of about 28 cents per pay-load ton-mile offered.[25] A projection of the past 5-year trend suggests a unit cost of less than 20 cents per capacity-ton-mile within a few years. This is for gross operating expenses, including sales, traffic, advertising, administration, and other overhead costs.[26]

Catering to enhanced passenger comfort has worked against a reduction in unit pay-load cost during recent years. In fact, the steady increase in the weight per passenger of passenger furnishings and safety equipment carried aboard the modern transport plane, has resulted in reducing the percentage of gross airplanes weight available for useful load.

From 1929 to 1940 this percentage has decreased in transport land planes from 40 to about 33 percent. Passenger furnishings now amount to about 175 pounds per passenger; and safety equipment represent another 15 pounds per passenger. Thus the operator now has to transport the equivalent weight of two passengers and baggage for every passenger fare he collects.[27] As a result, the pay load of the present transport plane is often only some 20 percent of the gross weight.

A plane designed strictly for cargo and mail traffic, on the other hand, may be able to increase the percent of pay load to gross weight very substantially, probably to 35 or 40 percent. A higher landing speed will be permissible where passengers are no longer involved, which in turn means a larger pay-load capacity. These factors, together with other changes in operation practice, may well result in an ultimate significant operating cost per cargo capacity-ton-mile approaching 5 or 6 cents.[28] To this would have to be added, of course, the airline's overhead, equivalent to perhaps 2–2.5 cents per capacity-ton-mile; as well as such pick-up and delivery expenditures as are inherent in handling cargo traffic.

The significance of these unit costs in the development of traffic potentialities in commodities, passengers, and mail will be considered in the following sections.

[25] Curiously enough, two essential characteristics of an air carrier are not reported to the Government, namely, the ton-miles of transportation service, both sold and unsold, operated by a carrier during a given accounting period; and the proportion of these capacity-ton-miles actually producing revenue. While the capacity-ton-mile unit costs developed herein are derived from incomplete or inconsistently reported data, they may probably be considered as within 10 percent correct.

[26] In a paper on "Economic Factors and the Evaluation of Air Transport Design," presented before the Institute of the Aeronautical Sciences January 28, 1940, by Edward Warner, Member of the Civil Aeronautics Board, the effect of anticipated improvements during the next decade are applied to an imaginary 16-passenger airplane with 1,800 take-off horsepower, maximum cruising speed of 191 miles an hour at 10,000 feet, and 50 percent of take-off horsepower, and an initial gross operating expense of 56 cents per mile. It is assumed that the airplane can handle 4,200 pounds of pay load, in addition to suitable reserves to fly a nonstop distance of 600 miles against a 40-mile wind. The conclusion is drawn that the final resultant cost for such an airplane within the next decade may be approximately 36 cents a mile at 180 miles per hour, 45 cents at 240 miles per hour. For the pay load indicated, this corresponds to 17–21 cents per payload capacity-ton-mile.

[27] "The Trend of Air Transportation." Edmund T. Allen, *Journal and Proceedings of the Institution of Mechanical Engineers for December 1939*, Vol. 142, pp. 127–40. See also "Wings for Transportation." Theodore P. Wright, *Journal of the Franklin Institute, April 1940*, Vol. 229, pp. 413–54.

[28] See *Business Week*, Oct. 19, 1940, p. 22.

Mail Traffic

Nature of Existing Traffic

The distribution of air-mail traffic over the country in August 1939, as shown in Fig. 32, emphasizes its present long-haul character. The West coast contributes a disproportionate share of both revenues and volume: air-mail revenue to the Post Office for domestic air mail at Los Angeles, Calif., for example, is 24.1 percent of the postal revenue at that city from nonlocal first-class mail, whereas at Detroit it is only 4.8 percent, at Philadelphia 3.9 percent.[29]

That air mail is predominantly a thin stream of high-speed long-haul traffic is emphasized by the length of average haul, 1,397 miles, against 478 miles for nonlocal first-class mail. Air mail in 1939 produced on an average 3.3 percent as much net tonnage as nonlocal letter mail, but 9.8 percent as much ton-mileage.[30]

Mail differs from other forms of air traffic in several important respects. The transportation of mail is a Federal Government monopoly and is subject to such regulations as the Government may see fit to impose. It is largely through its control of mail compensation that the Federal Government exercises close supervision over the operations of the air carriers.

Air-mail revenue is still the backbone of the air-transport industry. Indeed, it may be said to be the indispensable keystone in the airway arch, as without such assistance practically all the air lines would report substantial losses. While some of the larger carriers, such as Eastern Air Lines, now earn more than four-fifths of their total receipts from non-Government

[29] *Annual Report of the Postmaster General 1939*, Cost Ascertainment, Table 1.

[30] *Ibid.*, Tables 3, 4, 5, 40. Air mail also produced 5.5% as much revenue as nonlocal first-class mail.

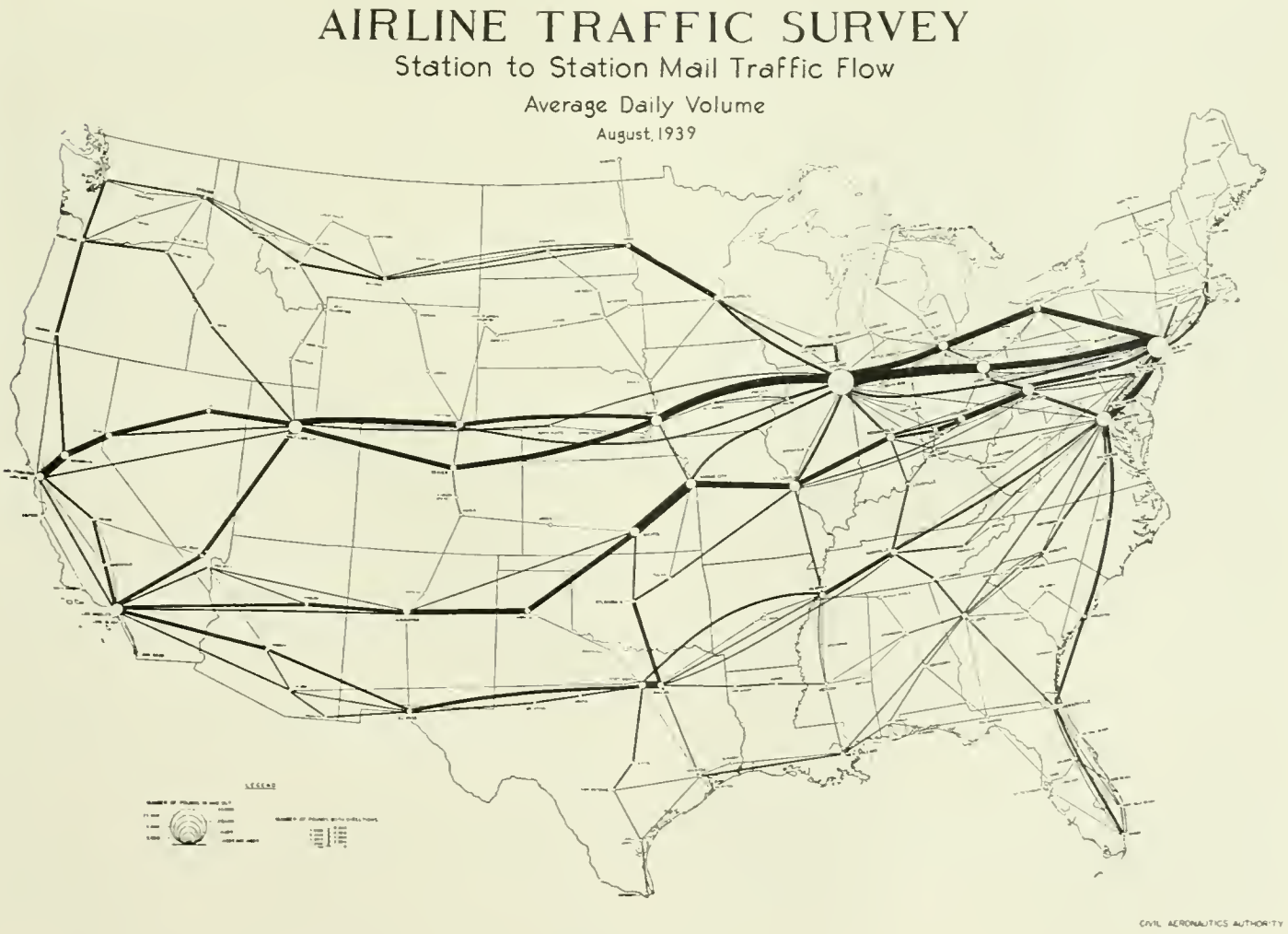


FIGURE 32

sources, air mail for many of the smaller operators still remains by far the largest single source of revenue.

The rate which the public pays for mail service, unlike passenger or express rates, is not set by the carrier. An operator can increase his air-mail volume only by inducing the Post Office to add additional mail routes or schedules, or indirectly by helping publicize the services available.

Volume of mail traffic is a function not only of the number of mail routes and frequency of service, but also of the rate of postage which the public must pay. A chronological record of the domestic air mail postal surcharge reveals a surprising variation in Government policy in this respect.[31]

From 1924 to 1927 a zoning system was attempted, which in 1926 was 10 cents per ounce or fraction up to 1,000 miles and 20 cents over 1,500 miles. In 1927 zoning was abandoned and a rate of 10 cents fixed regardless of distance but with half an ounce as the unit, instead of an ounce. In 1928 the rate was cut to 5 cents for the first ounce and 10 cents for each additional ounce. In 1932 this was again changed to 8 cents for the first ounce and 13 cents for each additional unit. Finally, July 1, 1934, the present rate of 6 cents for each ounce or fraction thereof was established.

This raises the question as to what would happen if the air-mail surcharge were now to be reduced. In Europe, for years a number of countries have forwarded their air mail at ordinary rates without surcharge. Pioneered by the Swedish Airlines, this principle of transporting unsurcharged mail by air spread over the Continent until by the summer of 1939 practically every European nation had accepted the plan to forward all first-class letter mail by air without extra postage anywhere in Europe, whenever and wherever air carriage offered quicker delivery.[32] Great Britain extended the "all up" air mail principle to her Empire air routes and in 1938 carried some 10 million ton-miles of mail.

Effect of Reduction in Surcharge

In the United States, nonlocal first-class mail in the fiscal year 1939 totaled some 70 million net ton-miles, of which about 75 percent involved travel a distance of 400 miles or more.[33] If we assume that mail traveling 400 miles or more can and ultimately should be expedited by air carriage, this would mean an additional mail traffic to the air carriers of something over 50 million net ton-miles. Adding the weight of containers at 10 to 12 percent,[34] the resulting gross mail traffic by air would be on the order of 70 million ton-miles, or some seven times the present air-mail volume.

The Post Office Department in 1939 paid the railroads for the transportation of all classes of mail some $100,000,000 of which approximately $20,000,000 was chargeable to first-class mail. If the volume of first-class mail forwarded by rail were reduced some 75 percent and the payments decreased in proportion, railroad receipts from the Post Office would only be reduced by 15 percent. Yet the great acceleration in first-class mail service might easily result, through expedited business turn-over, in increased space requirements to handle additional second-, third- and fourth-class mail matter.[35] The direct loss to the railroads in first-class mail revenue might be more than made up by the gain in postal revenue from an increase in other classes of mail matter. There is also the possibility that an enhanced rate of exchange of business correspondence will stimulate the gross volume of business turn-over and thus will act to increase the amount of freight moving on the railroads annually.

Neither would the Post Office gross revenues be adversely affected to an important degree by elimination of the surcharge and the transfer of three-fourths of all letter mail to the air. Although the present air-mail letter rate is twice that for ordinary letter mail, it is surprising to find the average revenue per pound to the Post Office from air-mail letters is only about 50 percent greater ($1.67 vs. $1.06). due to the greater number of pieces per pound in a pound of first-class letter mail.[36]

For this reason, and also because of the far greater distance the average air-mail letter is hauled, the Post Office receives from the public almost twice as much for every mile that a pound of first-class mail is hauled, on the average, as it does per pound-mile of air-mail service (2.3 mills gross revenue to the Post Office per net pound-mile of nonlocal first-class mail service rendered, as against 1.2 mills per net pound-mile for air mail).

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[31] Federal Coordinator of Transportation, "Public Aids to Transportation," 1940, Vol. 1, p. 161, table 27. For rates prior to 1924, see p. 9, *supra*.

[32] See footnote 4, Publication No. 5, Norwich University, p. 18. For History of European Non-Surcharged Air Mail, see *Revue Aeronautique Internationale No. 29*, September 1938, pp. 225–239, and 241–242. In Sweden the haulage fee for letter mail is 2.50 gold francs per ton-km., corresponding to $1.20 per ton-mile.

[33] Derived from field data reported to the Cost Ascertainment Division, Post Office Department, 1939.

[34] Cost Ascertainment Report, table 100, Postmaster General's Annual Report, 1939, pp. 38, 39. Cost Ascertainment pound-mile figures are net, while those given by the Division of Air Mail include the weight of the container. For the last 3-year period, 1937–39, inclusive, the average gross weight, including containers, was 113 percent of the net weight of the air mail.

[35] British postal authorities reported exactly this effect as a result of inaugurating their "all up" Empire air-mail program: The volume of second-class mail still sent by land and sea routes showed a definite increase, and mail revenues to steamship carriers were not adversely affected by the loss of letter mail to the airlines. See J. Parker Van Zandt, "Three-Cent Air Mail," *Aviation*, December 1938, p. 22.

[36] Cost Ascertainment Report, *op. cit.*, tables 2, 40.

Because we put only half as much postage on an ordinary envelope as we do on an air-mail letter, the average citizen is under the impression that air-mail service costs him twice as much as first-class mail service. Actually, on a pound-mile basis, the reverse is true.

As table 5 shows, the average aggregate cost to the Post Office for the transportation of nonlocal letter mail and air mail combined is 49 cents per ton-mile. If one-fourth of the existing letter mail were to continue to be forwarded by rail at current rates of postal compensation to the railroads, the combined balance of first-class mail and air mail could be hauled by air without additional cost to the Post Office at an average compensation to the air carrier of 52 cents per net ton-mile.[37]

TABLE 5.—*Postal Revenues and Expenditures per Ton-Mile Nonlocal First-Class and Domestic Air Mail*

Fiscal year 1939	Nonlocal first-class	Domestic air mail	First class and air mail
Net ton-miles (exclusive of containers)	69,557,800	6,812,351	76,370,166
	Per ton-mile		
Cost to mailing public (gross revenue to Post Office)	$4.60	$2.40	$4.40
Cost to Post Office:			
(*a*) For railroad or air transportation (gross revenue to carriers)	.29	2.52	.48
(*b*) For other apportioned expenses (viz. Post Office service 66 percent; rural delivery 11 percent; Railway Mail Service 8 percent, etc., of combined apportioned cost)	2.65	1.15	2.52
Total cost to Post Office	2.94	3.67	3.00

Source: Cost Ascertainment Report, 1939, tables 40, 60, 61, 100, 102.

First-class mail would still yield the Post Office an average profit of $1.40 per ton-mile, or well in excess of $100,000,000 per year. First-class mail has always yielded the Post Office Department a very substantial surplus over expenditures, while all other classes of mail have been charged with deficits, the largest of which has been on second-class matter (newspapers, magazines, and other periodicals).

If, in order to assure the expedition of first-class mail as suggested, it were necessary to increase the average postal compensation to air carriers above the 52 cents per ton-mile indicated, some of the large profit earned by this class of postal matter might be diverted for that purpose.[38]

What postal compensation to the air carriers would be necessary for the transportation of 70,000,000 ton-miles of mail per annum would depend on a number of factors, principally on the number of additional routes and schedules that would be required, and on the average mail loads. During the fiscal year 1940 transport planes in scheduled operation on the existing trunk routes each performed about 30,000 mail ton-miles of domestic air-mail service on the average. The transfer of a substantial percentage of first-class mail to the air might increase the average service on primary routes to, say, 60,000–70,000 mail ton-miles per plane per year. In other words, about 800–1,000 transport planes would be needed to handle this portion alone.

This, however, is only part of the story. There are some 1,200 first-class and 3,600 second-class post offices in the country. The former group produced in 1939 78 percent of the nonlocal first-class mail pound-mileage, the latter 12 percent. Yet on April 22, 1941, there were only 330 scheduled or authorized air-mail stops on domestic air-mail routes. Clearly, in order to service the mail properly, an "all up" mail policy providing next-day delivery to every important community in the country would require the development of a greatly expanded network of primary and feeder air routes.

A start along this line has already been made in Pennsylvania and West Virginia, where in 1939 an experimental mail service was operating, using a device which permits the pick-up and delivery of mail and express while the plane is in flight. Some 78 pick-up stations were served, at distances averaging less than 17 miles apart. In July 1940 the company[39] was granted a certificate of public convenience and necessity authorizing it to operate 5 short-haul mail and express routes out of Pittsburgh, making air mail available to 139 communities in 7 States.

The establishment of some 200 feeder routes contacting on the average 20 or more points per route would serve the originating centers for 90 percent or more of all nonlocal first-class mail. Such a feeder network might require the use of 1,000 additional, smaller type planes. While the cost per mile of operating these smaller planes would not be great, on a ton-mile basis it would probably be substantially more than service on the primary routes and might require an allocation of some of the surplus revenues earned by letter mail.

[37] Mr. Robert E. Lees, of the U. S. Maritime Commission, suggests 6-cent "air mail" need not be abandoned at once but, rather, first-class 3-cent mail service should be so improved that the use of surcharged mail would dwindle to a small special-delivery class.

[38] See Federal Coordinator of Transportation, "Public Aids to Transportation," vol. 2, p. 94. See also Commissioner Eastman's comments in 182 I. C. C. 203, Proposed Changes in Rates and Regulations Affecting Fourth-Class Mail Matter: "The showing on second-class mail is startling. Revenues (fiscal year 1930) were $30,708,810 and expenditures $120,410,648. If this is correct, the newspapers and publishers of the country are receiving a large subsidy at public expense." (For the fiscal year 1939 the deficit on second-class mail was still about the same; $87,264,000.)

[39] All American Aviation, Inc. See *Civil Aeronautics Board Orders Serial No. 596*, July 22, 1940, Docket 363. Also *Business Week*, August 31, 1940, p. 22.

A later section will consider the effect on the air transportation economy of such an expedited mail program, when combined with the traffic potentially available in commodities and passengers.

Commodity Traffic

Present Air Express

The movement of commodities by air has lagged in America. Abroad, where the number of passenger-miles flown is only a fraction of that in the United States, the volume of commodities moved by air is many times larger.[40]

While the absolute volume of express traffic in America has increased some 45 percent in the last 4 years, it has actually decreased in relative importance, both with reference to the total traffic handled by the airlines and to the total revenue earned. For the year ending July 31, 1940, for example, express revenues showed a 26.5 percent increase over the preceding 12 months. During the same period, however, passenger revenues increased 53.8 percent. This represents a passenger revenue increase of $15,830,000; and an express revenue increase of only $390,000. In actual dollars and cents the gain in passenger revenue was over 40 times more important to the carrier.

Table 6 shows the decreasing relative importance of air express in both traffic and revenues, in spite of its moderate growth. For the fiscal year 1940, express represented only 3.1 percent of the total ton-miles of service performed and brought in only 2.8 percent of the gross operating revenues of the 16 domestic air mail carriers. In that year passenger business represented over $43,000,000; express $1,800,000.

TABLE 6.—*Air Express Traffic*

[16 U. S. domestic air-mail carriers]

Fiscal year	Express traffic (ton-miles)	Express revenue to air carrier	Revenue per ton-mile	Express traffic in percent of total traffic	Express revenues in percent of total revenues
1935	803,000	$512,288	$0.648	3.0	2.2
1936	1,411,000	804,806	.583	3.5	2.5
1937	2,101,000	1,200,583	.576	4.2	3.2
1938	2,070,000	1,215,459	.586	3.8	3.0
1939	2,444,000	1,437,748	.588	3.7	3.0
1940	2,991,000	1,805,812	.604	3.1	2.8

NOTE.—Air carriers' express revenues represent net receipts after the Railway Express Agency has deducted some 33 percent of what the public pays for air express service to cover terminal, pick-up and delivery, and other service charges.

The average weight of an air express package in April 1939 was 6 pounds and the average distance hauled was 1.047 miles.[41] Applying these averages, we find that there were approximately 950,000 shipments, representing 2,860 tons of air express handled during the fiscal year 1940.

Comparison With Rail Express

During the same period, less-than-carload rail express shipments amounted to some 150,000,000, representing about 3,000,000 tons. Thus, the air express tonnage was less than 1/1000th of the rail express tonnage. During this same period, there were an additional some 30,000,000 tons of less-than-carload merchandise and parcel post transported on the railways of the United States.

The bulk of rail express traffic consists of package shipments and there is virtually no limit to the variety of articles and commodities which may be handled. Small shipments of commercial goods, wares and merchandise of every description form the bulk of the traffic from manufacturers and distributors to retailers and consumers. Personal shipments, all kinds of valuable, medicines, serum, newsreel, and first-run picture film form part of rail express traffic.

A great deal of this business is indistinguishable from less-than-carload freight traffic, the only common difference being in the size of the shipments. The average weight per shipment of all less-than-carload first-class rail express is 29 pounds. The average weight of express "parcels," meaning all first- and second-class shipments between one and 100 pounds, is 21 pounds.[42] The average less-than-carload merchandise shipments consists of several packages and weighs in the neighborhood of 300 pounds.[43] Parcel post shipments are limited by law to 70 pounds; 9 out of 10 weigh 11 pounds or less and the general average is about 5 pounds.[44]

A large proportion of this traffic, particularly the smaller packages, is susceptible to movement either by Post Office parcel-post service, rail-express service, freight-forwarder service by rail, by truck, or by air express. The method cheapest to the consignee appears to be the controlling factor for the great bulk of the traffic.

The present basic air express rate structure was established in August 1934, and has not been changed since then, except for a minor increase in the minimum charge from 85 cents to $1 for packages weighing

[40] J. Parker Van Zandt, "European Air Transport on the Eve of War," *Publication No. 5*, Norwich University, pp. 16–17, 28–29, tables V, XII, XIII.

[41] Railway Express Agency Analysis of Air Express Traffic, April 1939, vol. 3, "Commodities, Weights, and Distance Scales."

[42] Results of Tests Conducted in June and October, 1938 and 1939, by Railway Express Agency, filed with I. C. C. Ex Parte No. 126, Express Rates, 1938–39.

[43] Hearings on S. Res. 146 before Senate Committee on Interstate Commerce, June 24, 1940, on Less-Than-Carload Freight Traffic and Freight Forwarder Carload Traffic, p. 295. See also Federal Coordinator's Merchandise Traffic Report, 1934; p. 13.

[44] Cost Ascertainment Report, tables 41 and 6. See also *op. cit.* 231 I. C. C. 486.

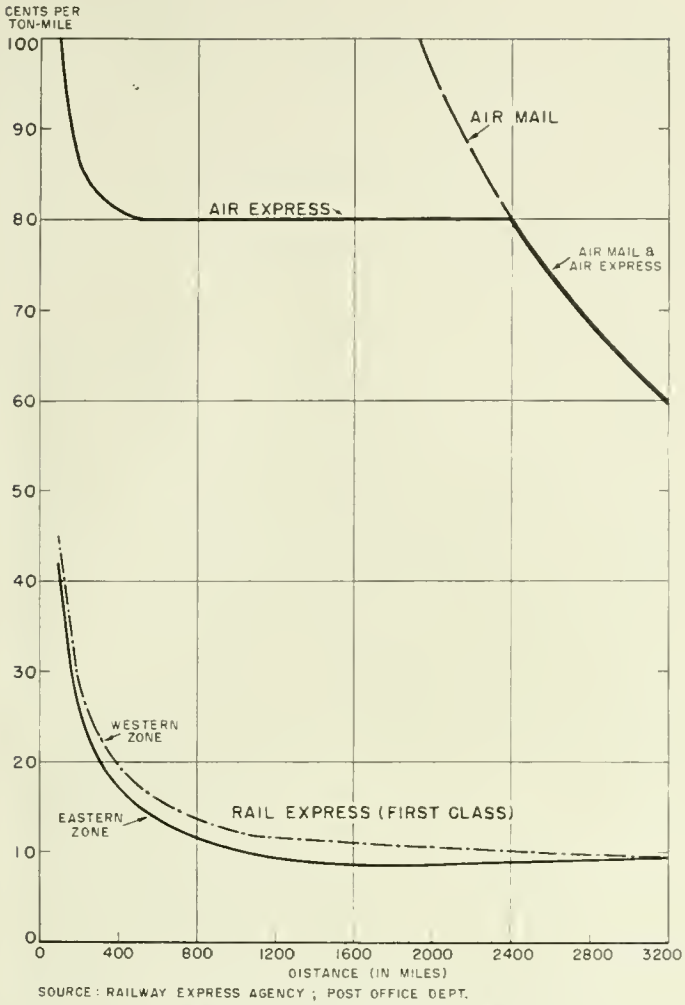

FIGURE 33.—Rail and Air Express and Air Mail Charges, Per Ton-Mile for a 20-Lb. Shipment, 1940

three-fourths of a pound or less. The rate structure is based on a charge of 4 cents a pound per 100 miles, with a maximum of 96 cents a pound. (But air mail, at 6 cents an ounce, also costs 96 cents a pound. Hence, above 2,400 miles cargo may be sent by air mail as cheaply as by air express.) For low weight shipments an additional arbitrary is added of 92 cents for 1 pound hauled 149 miles or less. This arbitrary diminishes with weight and distance at the rate of 4 cents per pound and 4 cents per 100 miles until dissipated, or until the air mail rate is reached.

There is no fixed relationship between air express rates and rail express rates since they are computd on entirely different bases. The present system of block-express rates is a distance basis of rates in the computation of which three elements, or cost-factors, are combined: (1) a haulage charge to cover the rail transportation and care accorded shipments in transit; (2) an allowance for rail terminal service, distributed on a weight basis; and (3) an allowance to the express company covering the cost of its terminal service, including all local agency expense, plus a reasonable return. This third element is applied on a package rather than a weight basis.[45]

The express terminal allowance under the 1914 revision was originally 20 cents, included in each charge under 100 pounds. In the revision of 1925 the express terminal allowance was increased to 35 cents. In the revision of 1939 the express terminal factor was reduced on smaller packages to a minimum of 25 cents in order to place the express service in a better competitive relation to parcel post and motor carriers. Parcel post charges in the 25 years since the Post Office established this service have followed a downward trend, while express rates have increased, with the result that parcel post has largely superseded express service as the predominant form of transportation for small packages.[46]

A comparison of the charges by rail and air express for an average shipment of 20 pounds hauled varying distances is shown in Fig. 33. The ton-mile rail rate drops very rapidly with distance hauled, from 20 cents for 300 miles (in the eastern zone) to 15 cents at 500 miles, and to less than 10 cents for distances over a thousand miles. The air express ton-mile rate, on the other hand, is constant at 80 cents for a shipment of this size for all distances between 500 and 2,400 miles.

Thus, it will be noted that for shipments of average weight traveling over 700 miles the air rate is from

TABLE 7.—*Average Weight and Charge per Air Express Shipment*

[April 1939]

Commodity	Shipments (percent of total)	Weight (percent of total)	Charges (percent of total)	Average weight (pounds)	Average charge
Total	100.00	100.00	100.00	6.0	$2.673
Machinery, hardware	17.61	26.69	23.33	9.1	3.542
Printed matter	17.84	25.66	18.73	8.7	2.808
Store merchandise	13.59	11.55	14.06	5.1	2.765
Moving picture films	4.71	7.41	9.29	9.5	5.276
Electros	6.92	4.86	5.29	4.2	2.044
Valuable papers	6.82	3.96	4.94	3.5	1.936
Cut flowers	3.20	2.66	3.48	5.0	2.912
Valuables	5.20	3.41	3.29	3.8	1.688
Miscellaneous merchandise	2.71	2.97	3.14	6.6	3.105
News photos	6.04	1.28	2.72	1.3	1.206
Drugs, etc	2.26	2.02	2.15	5.4	2.527
Phonograph records	2.77	1.52	1.97	3.3	1.897
Freight manifests	3.47	1.57	1.97	2.7	1.515
Jewelry, food, optical and camera, raw samples, office supplies, personal baggage, liquor	6.86	4.43	5.63	3.9	2.191
Rail express parcels, 1939 [1]				21.3	.807

[1] See reference footnote 42, tables G, H, I, J. Tests were made on June 15 and October 3, 1939. 96 percent of all first-class and 88 percent of all second-class shipments weigh between 1 and 100 pounds. Second-class rates are 75 percent of first-class, apply to only 3.6 percent of the total less-than-carload rail shipments.

[45] 231 I. C. C. 485, Ex Parte 126, Express Rates, 1938–39. See also Kent T. Healy, "Economics of Transportation in America," 1940, pp. 236, 463.

[46] 231 I. C. C. 486.

6½ to more than 9 times greater than the first-class rail express rate. This may explain, in part, why air express has not developed as rapidly as other forms of air traffic.

The emergency character of the present air express business may be seen in the relatively higher charge and lower weight per shipment for each of the principal types of commodity listed in Table 7. Whereas the typical rail express "parcel" weighs 21 pounds and pays 80.7 cents, the air express package weighs only 6 pounds and pays $2.67.

Estimate of Potential Commodity Air Traffic [47]

Since the transportation of commodities is a business competitive principally on a price basis, some estimate of ultimate air freight rates is prerequisite to a decision as to what proportion of this business may ultimately move by air. Such an estimate involves a determination of the average load factor based on traffic flow, pick-up and delivery costs, and operating expenses, all of which can only be conjectural in advance of actual experience. In a preceding section we have already indicated possible future operating expenses per cargo capacity-ton-mile.

The average load factor will be largely dependent upon the degree of unbalance in the flow of traffic over the air routes operated. In general, more higher grade express moves from the east to the west and south than vice versa; while the reverse is true of lower class express and freight. An analysis of the air express flow for the month of August 1939, shows an average of 1¾ pounds moving westward for every pound moving east.[48] Other analyses confirm the preponderance of traffic flow outbound from the eastern industrial area. Under these circumstances, it appears doubtful if, for a comprehensive air freight network, a load factor in excess of 65 or 70 percent can be attained, and the average may be lower.

An estimate of pick-up and delivery expenses on an allocated ton-mile basis may be made by consideration of existing rail express traffic: A typical first-class rail express shipment weighs 29 pounds and represents 7¼ ton-miles. The corresponding figures for less-than-carload rail express of all classes are 41 pounds, about 15 ton-miles.[49] The future average air freight shipment is assumed to weigh 25 pounds and represent 8 ton-miles.

It has been mentioned that the rail express charge for a number of years prior to 1939 contained an allowance to the express company of 35 cents per package of less than 100 pounds, designed to cover the cost of its terminal services, including local agency expense, plus a reasonable return. When the I. C. C. recently approved the Railway Express Agency's request to reduce this express-terminal factor, the change was not supported by any actual study of terminal operating costs.[50] For traffic moving at first class rates a 35-cent terminal charge is equivalent to 4.8 cents per ton-mile. Total operating expenses per shipment, as reported by the Railway Express Agency, were 70 cents in 1939, equivalent to about 4.6 cents per ton-mile.[51] On the basis of an average terminal charge of 45 cents per shipment, the equivalent pick-up and delivery expense per air-freight ton-mile would be 5½ cents.

Applying these data we find, as indicated in table 8, an average possible charge for air freight of 18 cents or less per ton air-mile. This, as table 9 shows, is roughly equal on an equivalent basis, to the present charge for first-class and parcel rail express shipments.

TABLE 8.—*Estimated Future Cost er Ton-Mile of Air Freight Compared With First-Class Rail Express*

Transportation costs per capacity ton-mile (direct and airline overhead)	7.5¢
Average cargo load factor	65%
Transportation costs per ton-mile carried	11.5¢
Pick-up and delivery cost per ton-mile carried [1]	5.5¢
Profit at 5 percent gross revenue [2]	0.9¢
Average charge per ton air-mile, air freight	17.9¢
Average charge per ton air-mile, rail express parcels [3]	17.6¢
Average charge per ton air-mile, first-class express [3 4]	17.1¢

[1] Based on 45 cents per shipment average terminal expense.

[2] Gross annual revenue in this type of operation should be at least 2 or 3 times the investment. Hence, 5 percent of gross revenue is equivalent to 10–15 percent on investment.

[3] See table 9.

[4] Traffic moving at first-class rates represents 69 percent of the total less-than-carload rail express shipments, 71 percent of the gross income, 50 percent of the total weight.

First-class rail express traffic in 1939 represented approximately 750,000,000 ton-miles per annum. Hence, it does not appear unreasonable to expect that air freight, under favorable circumstances, ultimately may develop a traffic of some 500,000,000 to 600,000,000 ton-miles annually, representing a gross revenue in the neighborhood of $100,000,000. This would mean an in-

[47] Confusion often arises in the use of the terms "air express" and "air freight." Webster's New International Dictionary (1940) defines freight as "the ordinary transportation of goods directly afforded by a common carrier." Express is defined as the conveyance of goods "in a manner different from ordinary freight in affording greater care, security, rapidity of transit, quickness of delivery, etc." This same basic distinction presumably will apply equally well to commodities transported either by air, or by rail. Articles of high market value per unit weight in general can best afford preferential service. Where means of surface transport, however, are lacking or are particularly handicapped, as in some places in Central America and elsewhere, cargo of relatively low intrinsic value, such as chicle, may move by air in large volume.

[48] Station to Station Airline Traffic Survey, August 1939, C. A. A.

[49] See footnote 42. Also, Federal Coordinator's *Merchandise Traffic Report*, Exhibit 113–A, p. 248.

[50] See footnote 46.

[51] Hearings on S. Res. 146 before Senate Committee on Interstate Commerce, June 24, 1940, on Less-Than-Carload Freight Traffic and Freight Forwarder Carload Traffic, p. 383.

crease of some 40 times the present gross air express receipts (including that presently deducted by the Express Agency), and an increase of about 200 times in the volume of air cargo handled.

TABLE 9.—*Average Weight, Haul, and Charge per Ton-Mile for Commodities by Rail or Air*

How shipped	Weight per shipment	Average haul [1]	Ton-miles per shipment	Charge per shipment	Charge per ton-air mile [2]
Rail express "parcels" [3] (first and second class, 1–100 pounds)	*Pounds* 21	*Miles* 500	5.25	*Cents* 81	*Cents* 17.6
First-class rail express [3]	29	500	7.25	109	17.1
Present air express [4]	6	1,050	3.2	267	83.4
Future air freight (estimated)	25	650	8.1	145	[5] 18.0

[1] Distances, while derived from the best available sources, must be considered approximate only.
[2] Average rail distance is taken as 14 percent greater than direct air-line distance. See comparison of Security Owners Association, "A Study of Transportation by Airway," November 1932, p. 27.
[3] See footnote 39.
[4] Based on R. E. A. Analysis of Air Express Traffic, April 1939. For the year ending Oct. 31, 1939, the average weight per shipment was 6.8 pounds, the average charge $2.73.
[5] See table 6.

Naturally, such a volume of business can only be realized through years of painstaking development and growth. It involves not merely the introduction of a fleet of low-cost cargo planes, but the establishment of competitive commodity rates and their effective application by means of an integrated Nation-wide service. On these premises and those already indicated in the preceding paragraphs, a rapid development in the transportation of commodities by air should not be contingent upon direct Government assistance.

Passenger Traffic

Nature of Existing Traffic

In the last 10 years, to the end of 1940, revenue passenger-miles flown on scheduled domestic airlines have increased from less than 1 percent to approximately 12 percent of Pullman passenger-miles. While much of this air traffic represents a diversion from rail and highway travel, a substantial portion undoubtedly

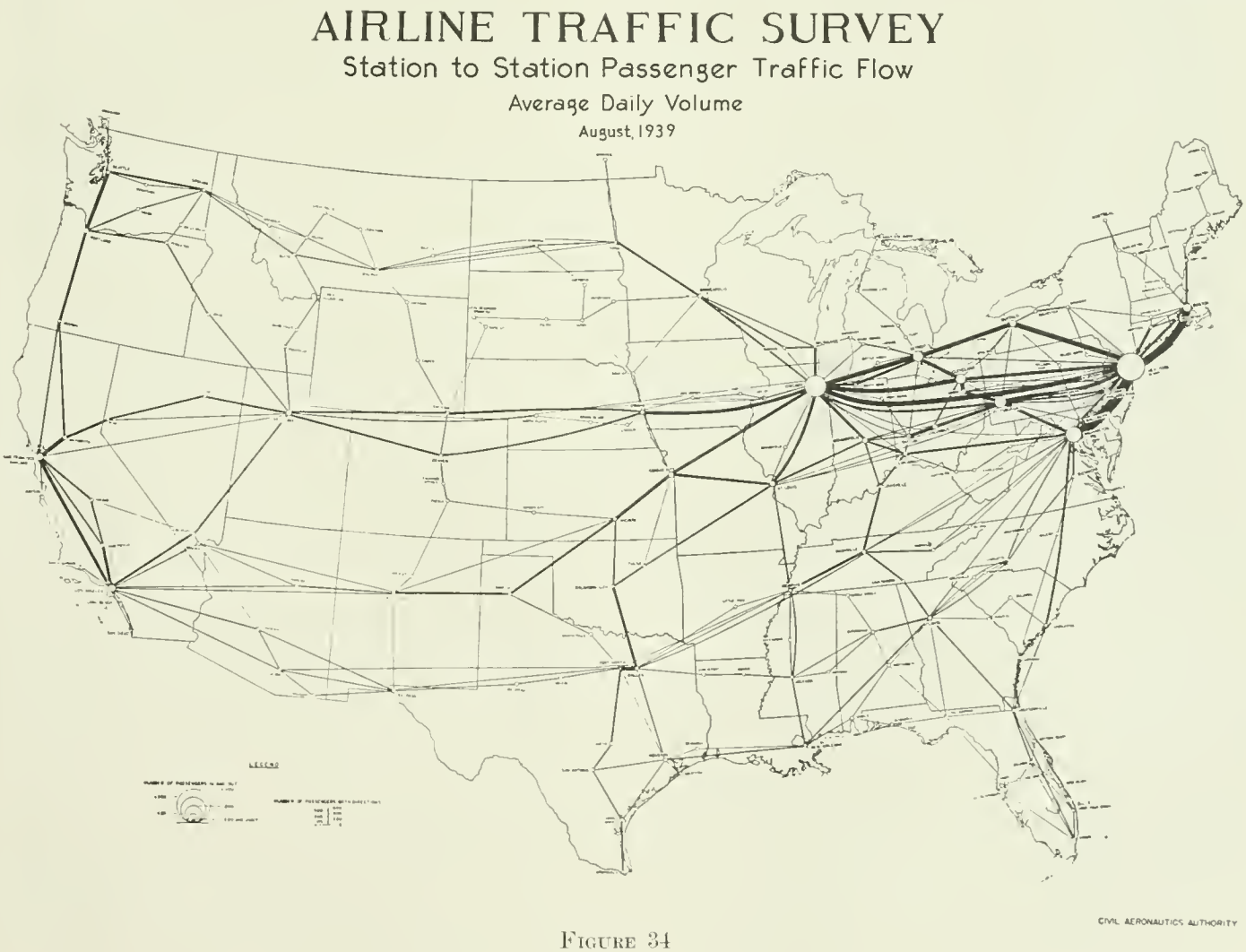

FIGURE 34

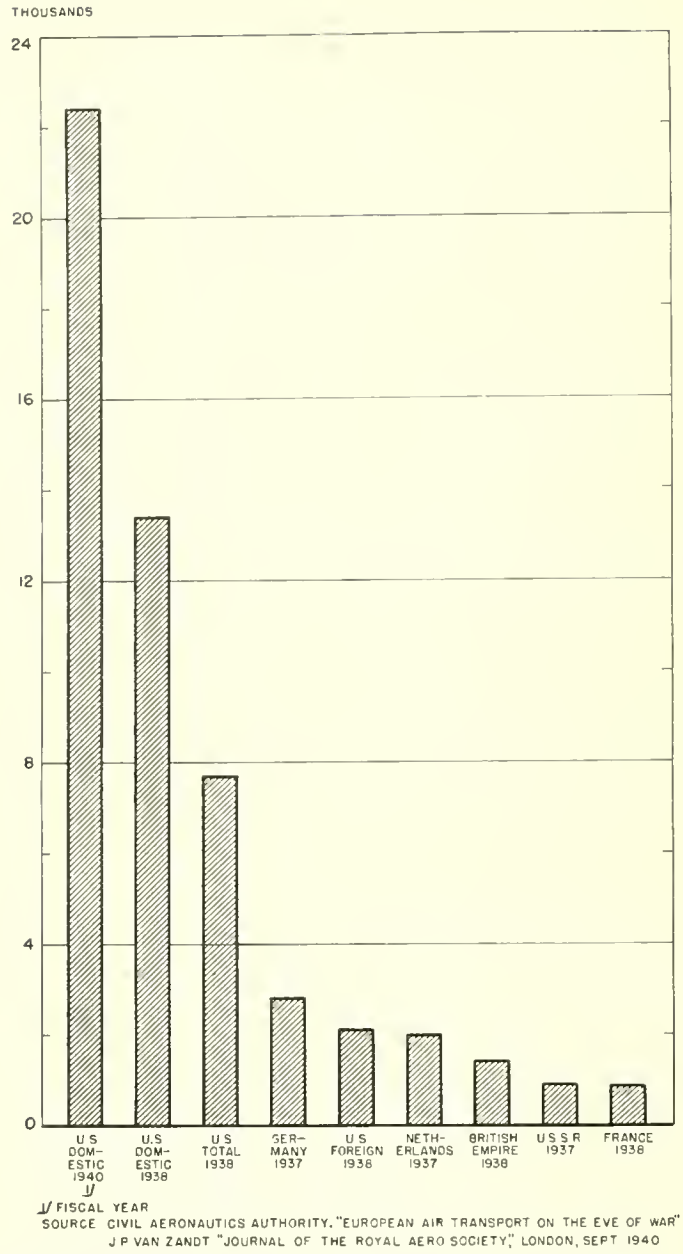

FIGURE 35.—Airline Passenger Traffic Density (Passenger Miles Per Route Mile) United States and Principal European Countries

is genuinely new traffic, brought into being by the acceleration which air transportation affords.

Half the airline passengers travel less than 300 miles. Indeed, the average air journey is not as far as a typical trip by Pullman (490 versus 550 miles)[52] As Fig. 34 shows, a substantial proportion of the total passenger traffic is concentrated in a relatively small area bounded by Chicago, Boston, and Washington. The most popular routes are New York-Washington, New York-Chicago, and New York-Boston. Passenger travel is much more highly concentrated in the eastern industrial area than is mail traffic (see Fig. 32).

Although less numerous, the long-haul air passenger is the more important revenue producer: Comparing the relative passenger-miles (to which revenues are closely proportional), persons going 1,000 miles or more contributed almost four-tenths of the total in November 1939, while passengers traveling over 700 miles accounted for 52 percent (table 10). Business travel appears to predominate on airlines, to a greater extent than on railroads.[53]

The number of passenger-miles flown per mile of route operated (traffic density) has been increasing rapidly and far exceeds that of any other country (Fig. 35). The average in the fiscal year 1940 for domestic airlines was 22,500 passenger-miles per route-mile, but there is, of course, an extreme variation in density between individual routes, amounting to perhaps 100 times.

For many years passenger traffic was so subject to seasonal variation that it used to be said the airlines spent their summers trying to recover from their winters. Travel in January, as shown by the seasonal index in table 11, was scarcely half the August peak. Fortunately, this winter bug-a-boo is rapidly ceasing to be an important factor. Revenue passenger-miles in January 1940, for example, were almost four-fifths as great as the monthly average for the fiscal year 1940.

TABLE 10.—*Percentage Distribution of Revenue Passenger Miles and Number of Passengers, by Distance Travelled per Passenger, Domestic Air Carriers, November 1939*

Miles per passenger	Percent of total passenger-miles [1]	Percent of passengers
0–499	40.1	70.4
500–999	28.7	19.5
1,000–1,499	14.5	5.5
1,500–1,999	8.1	2.2
Over 2,000	12.5	2.4

[1] Revenue.

Source: Civil Aeronautics Authority.

One result of filling in the winter slump has been a decided improvement in the average annual load factor, which approached 59 percent in 1940. The saw-tooth character of the load factor curve during the past years (Fig. 36) is due in part to the introduction at various intervals of larger planes as the manufacturers produced improved models.[54] An optimum average load factor for the industry much above 60–65 percent can

[52] Civil Aeronautics Authority Airline Traffic Survey, November 1939. Per airline, the average air trip was 379 miles.

[53] "The Growth of Air Passenger Traffic and Its Relation to Railroad Passenger Traffic," Royce A. Wight, Civil Aeronautics Board, 1940, p. 5.

[54] The average number of seats per plane in the fiscal year 1940 was 15.4, compared to 6.6 in 1932.

TABLE 11.—*Seasonal Indices of Domestic Air-line Traffic*[1]

[By months]

Month	Revenue passenger-miles flown	Mail pound-miles flown	Express pound-miles flown
January	62.91	89.78	85.66
February	66.49	89.79	81.89
March	97.03	105.34	103.38
April	96.08	98.37	91.45
May	109.52	102.96	99.68
June	114.43	101.01	104.73
July	121.31	102.61	94.27
August	123.15	103.87	98.39
September	121.15	99.02	115.15
October	114.77	104.17	124.15
November	91.13	95.68	103.39
December	82.03	107.40	106.86

[1] Based on data from May 1934 to June 1939; computed by averaging the ratios of the actual figures for each month to the moving average of the data (2 months' moving average of a 12 months' moving average). These indices have only a limited value, for a larger period of time is usually deemed essential for the construction of a reliable seasonal index. Furthermore, in the case of passenger-miles, recent data suggest that a marked shift in seasonal characteristics is taking place. Hence the index shown in this table probably does not reflect present seasonal variation in passenger traffic accurately.

Source: Civil Aeronautics Authority, Air Traffic Survey, August 1939, p. 203.

scarcely be expected, as there will probably always be a wide fluctuation in peak demands.

A large number of factors have contributed to the growth in passenger traffic, among them the vastly increased comfort of air travel, the more frequent schedules, greater speed, fewer cancelations or delays,

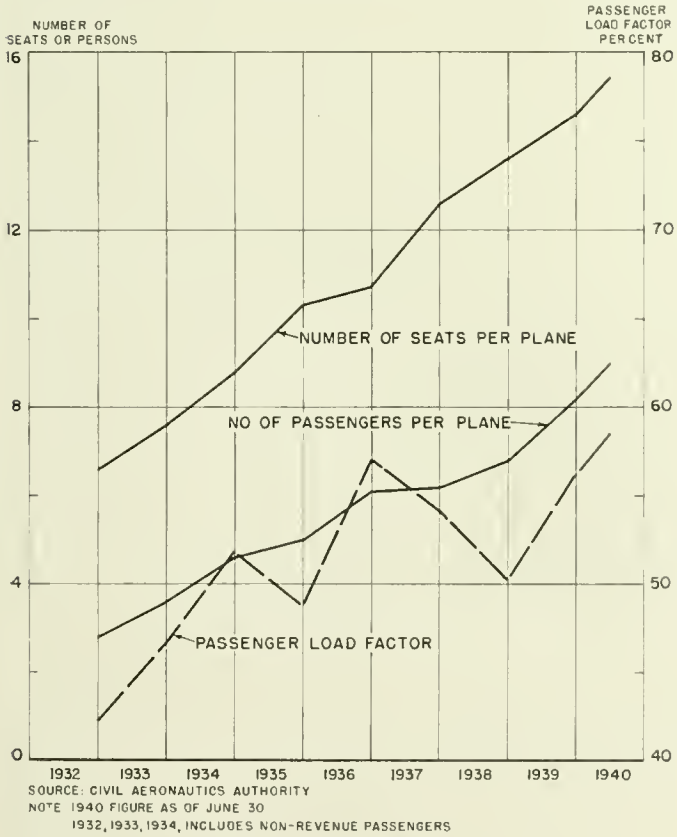

FIGURE 36.—Passenger Loads and Seats Per Airplane, U. S. Domestic Airlines, 1932–40

better traffic organization and promotion, greater reliability. Most important of all has been the remarkable advance in safety: in the last 5 fiscal years there has been an accelerating rate of improvement in operating safety, particularly on domestic routes.

For the 17 months ending in August 1940, domestic air carriers flew over a billion passenger-miles with a perfect safety record. During the winter of 1940–41 a series of accidents marred the airline safety record, raising the calendar year 1939 average of 1.2 passenger fatalities per 100,000,000 passenger-miles flown, to 3.0 in the calendar year 1940.

While the safety curve for air carriers naturally exhibits a saw-tooth character over the past several years, nevertheless the general trend is steeply downward, from an average rate of 26 passenger fatalities per 100,000,000 passenger-miles in 1929, to approximately 2.0 by the end of 1940. Thus, in 15 years from the start of scheduled domestic air transportation service, airlines have reached a point equal to the level of safety attained by rail carriers 70 years after the start of rail transportation.

Extrapolating the general safety curves for both air and rail carriers suggests that the two safety trends will merge by 1950.

Since accidents in any form of transport obviously can never be completely eliminated, it appears reasonable to predict that within the next decade the safety factor will cease to be a serious deterrent to air travel on the part of the vast majority of travellers.

With increasing public acceptance, the factors which have so far contributed most to the growth of passenger traffic will decrease in relative importance and the question of fares will become increasingly significant.

Future Traffic Potentials

Prior to 1930 air-line passenger rates were approximately three times higher than Pullman fares. Today they average some 60 percent higher.[55]

Pullman traffic in 1939 approximated 8.5 billion passenger-miles at an average rail and Pullman charge of slightly over 3 cents per mile.[56] Average air-line costs per capacity seat-mile, we have seen, are tending toward 1.5–2 cents and load factors toward 60 percent. Hence, an average air-line charge not much, if any,

[55] Including the cost of meals and other incidentals saved, the divergence is considerably less, on the average. That rates have not played a dominant part in the enormous growth of passenger traffic in recent years may be confirmed by Fig 28, where air-line average charges are seen to have been relatively stable at 5 to 6 cents since 1935. Rates to the general public, however, are somewhat higher than the average indicated, since the most frequent patrons of the air lines take advantage of a 15-percent discount under the so-called air travel card plan.

[56] I. C. C., Bureau of Statistics, Graphical Supplement to Monthly Reports, Series 1939, No. 9.

above 3 cents per mile appears to be in sight within a predictable future.

Taking into consideration savings in meals, hotel bills, and incidentals, such a rate in many instances would be considerably lower than the present cost of Pullman travel. It might well be argued that with no great difference in safety, with equal convenience, and with roughly equivalent rates, the great time advantage of the air lines will ultimately attract substantially all first-class long-haul passenger traffic to air travel. This does not imply that Pullman travel would disappear, for it would remain more convenient for much short-haul traffic. Much of the increase in airline traffic would represent newly created travel, or diversion from other sources.

As a generous margin of conservatism, let us assume that within the next decade or two air travel in the United States will assume proportions equivalent to approximately 70 percent of present-day Pullman rail travel, or about 6 billion revenue passenger-miles. This would represent a sevenfold increase over the passenger-miles flown by domestic air carriers during the fiscal year 1940.

The resulting combined potential traffic in passengers, mail, and commodities is summarized in table 12.

Thus, under favorable circumstances it appears possible that within the next decade or two domestic air traffic may increase some 12-fold, with a corresponding 5- to 6-fold increase in gross operating revenues. The resulting traffic volume would be well over a billion ton-miles per year, the annual gross income three or four hundred million dollars.

TABLE 12.—*Estimated Potential Domestic Air Carrier Traffic and Revenues*

Type of traffic	Present annual [1]traffic (fiscal year 1940)	Approximate ratio of future to present (estimated)	Future annual traffic (next decade	Assumed future average revenue per ton-mile	Future gross annual revenue
	Ton-miles		*Ton-miles*		
Passengers	85,500,000	7	600,000,000	$0.33	$200,000,000
Commodities	3,000,000	185	550,000,000	.18	100,000,000
Mail	9,400,000	7	65,000,000	[1] 1.00	65,000,000
Totals and averages	97,900,000	12.4	1,215,000,000		365,000,000
Average charge per ton-mile	$0.66	.45		$0.30	

[1] Average mail revenue estimated on basis of two-thirds of mail carried at an average compensation of 50 cents per gross ton-mile and one-third, on light feeder routes, at an average compensation of 10–15 cents per plane-mile for an average mail load of 100–150 pounds, or $2 per mail ton-mile. At this rate, the gross additional transportation expenses to the Post Office for country-wide expedited mail service would be in the neighborhood of $34,000,000, most of which would go for the "rural delivery" air-mail routes.

This is a rough measure of the potential domestic industry—exclusive of operations on foreign air routes—to which the Government's transportation policy should be directed.

GOVERNMENT REGULATION AND PROMOTION OF AIR TRANSPORTATION

Administration and Regulation to 1938

Substantial Federal interest in air transportation was first shown in the air-mail experiment pioneered by the Post Office Department between 1918 and 1926. During this period the airlines were owned and operated by the Government.

When the air-mail service was turned over to private industry in 1926–27, the function of the Post Office Department became both promotional and regulatory.[57] Through generous mail contracts, the Department fostered the development of private air transportation companies, and through authority to designate air-mail routes, grant route extensions, and determine frequency of schedules, controlled both the direction and extent of the developing transportation system.

Government economic regulatory powers were broadened during ensuing years, particularly in 1934–35, when mergers or interlocking directorates between air-mail carriers and aviation manufacturers were prohibited. The Interstate Commerce Commission was given control over accounting procedure as well as power to review and fix new rates on existing air-mail routes, while the Post Office Department retained authority to designate new routes and award air-mail contracts therefore to the lowest responsible bidder.

Thus, in addition to a division of economic control between two agencies, Government economic supervision was made incidental to air-mail compensation and bore only an indirect relation to a carrier's passenger and express business. Over nonmail operators the Government had no economic control at all.

The promotion and regulation of nonscheduled as well as scheduled flying was begun in 1926. The Bureau of Air Commerce, established in that year, undertook the development and operation of a system of civil airways, including intermediary and emergency airports, communications facilities, and weather reporting in cooperation with the Weather Bureau. Regulatory duties of the Air Commerce Bureau included licensing of all flying personnel and aircraft, investigation of accidents, and promulgation of rules designed to increase the safety of flight.

[57] *Investigation of Executive Agencies of the Government*, "Government Activities in the Field of Transportation", Sen. Report 1275, 75th Cong., 1st Sess., pp. 368–380.

In the construction and operation of first-class airports, which constitutes one of the most important elements in the development of an airline system, municipalities have heretofore played a dominant part. Federal agencies have also contributed importantly with both financial and technical aid.

Labor relations in the air-transportation industry are governed principally by the Railway Labor Act of 1926, as amended, which places labor disputes under the jurisdiction of the National Mediation Board.

Contrary to developments in highway transportation, the regulation of the air-transport industry became highly centralized in the Federal Government at an early period in its history. Nevertheless, many States have enacted legislation more or less duplicating some of the license and traffic regulations of the Federal Government. While comprehensive Federal control seems the most logical approach to an industry which is so essentially interstate in character, it is argued by some that uniform regulations of a central authority may prove more inadequate because of regional differences in conditions affecting air transportation.

The Civil Aeronautics Act of 1938

The Civil Aeronautics Act of 1938 substantially broadened Federal regulatory powers and centralized them in a single, independent agency, the Civil Aeronautics Authority.[58] In 1940, however, a further reorganization took place and the Authority was divided by Executive Order into two distinct agencies: (a) the Administrator of Civil Aeronautics, a division of the Department of Commerce; and (b) the Civil Aeronautics Board, an independent agency within the framework of the Department of Commerce.[59]

The Administrator's functions parallel the promotional and administrative duties of the old Bureau of Air Commerce, namely, the development and operation of airways, aircraft inspection, licensing pilots and aircraft, and the enforcement of safety rules and regulations. The Administrator also supervises the Civilian Pilot Training Program, which has been greatly expanded since its inception in 1939.

The Civil Aeronautics Board, composed of five members, is primarily a regulatory agency, charged with the economic regulation of scheduled air transportation, the prescription of safety rules and regulations, the investigation of accidents, and the revocation of pilot and aircraft certificates.

Among the Board's major economic regulatory powers not previously held by the Post Office Department or the Interstate Commerce Commission, are: (a) the power to grant certificates of convenience and necessity for air routes, without which no carrier is permitted to operate in interstate commerce; (b) wide discretionary power in the manner and methods of fixing air-mail rates; (c) the power to regulate passenger and express charges; and (d) to approve or prohibit interlocking directorates and to pass on all mergers between existing carriers or between an air carrier and any other type of company.

Under the present law air-mail routes are no longer dependent on competitive bidding for Post Office mail contracts. Further, the financial need of the carrier is recognized as an element in the determination of rates of mail pay, together with the triple requirements of commerce, the Postal Service, and the national defense. The adoption of these basic policies has served greatly to strengthen the growing air transportation industry and to attract additional capital to the field.

Principles of Public Aid

In Europe, air transport was early recognized as an important instrument of national policy and defense. In the United States this aspect of civil aviation, while accepted in principle, has never been as heavily stressed and, indeed, on occasions appears to have been largely overlooked.

The first legislation designed to encourage air transportation was brought about at the instigation of the Army Air Corps, with the thought of creating a civil aviation industry as a second line of national defense.

Less than ten years later, however, considerations of national defense were largely forgotten and Congress proposed to restrict the air-mail services of the country to a self-supporting basis.[60] At the same time, while ignoring the defense elements in air-mail service and placing it on a cost basis, second-class mail service was continued on the basis of a net postal deficit of some $90,000,000 annually.

In 1938 Congress reaffirmed its support of air transportation as an instrument of national policy and

[58] Leverett S. Lyon, Victor Abramson, and Associates, "Government and Economic Life," vol. II, p. 854.

[59] See Reorganization Plan No. IV, effective June 30, 1940. H. Doc. 692, 76th Cong. 3d sess. The routine office management functions of the Board are performed under the supervision of the Secretary of Commerce in order to avoid uneconomic duplication of facilities. The Board's reports to Congress and to the President are submitted through the Secretary of Commerce, but the latter has no power to delete or revise them. The Board submits its own budget and has full control over its personnel and expenditures. The decisions of the Board are in no way subject to review by the Secretary of Commerce.

[60] 227 I. C. C. 498, *Postal Revenue Limitation on Air-Mail Rates*, (1938). Sec. 6 (e) of the Air Mail Act of 1934, as amended, directed that compensation to the air carriers "shall be designed to keep the aggregate cost of the transportation of air mail on and after July 1, 1938, within the limits of the anticipated postal revenue therefrom." General adoption of the principle that each class of mail service shall be conducted only on a self-supporting basis would involve very far-reaching adjustments in present postal operations.

defense. The declaration of policy of the Civil Aeronautics Act states as being in the public interest: "the encouragement and development of an air transportation system properly adapted to the present and future needs of the foreign and domestic commerce of the United States, of the Postal Service, and of the national defense."

Thus the law presently authorizes the development of air transportation to the maximum extent and of whatever character and quality the national defense may require. The wisdom of such a program has been heavily underscored by recent events in Europe.

Provision of essential air navigation facilities has always been recognized as a public responsibility, both for scheduled and nonscheduled operations, on much the same principle that coastwise navigation aids are freely provided for vessels at sea.[61]

Federal participation in airport development as a matter of a permanent policy was recommended to Congress in 1939 by the Civil Aeronautics Authority.[62] Recently, a plan has been outlined by the Assistant Secretary of Commerce involving an outlay of some $600,000,000 during the next 6 years and affecting 4,000 airports.[63] A start toward such a long-range program was made in October 1940, as we have noted, when Congress appropriated $40,000,000 for this purpose.

The air transportation industry in general is not yet self-supporting. Hence, in Government payments to air carriers for the transportation of mail an element of direct aid has usually been included.

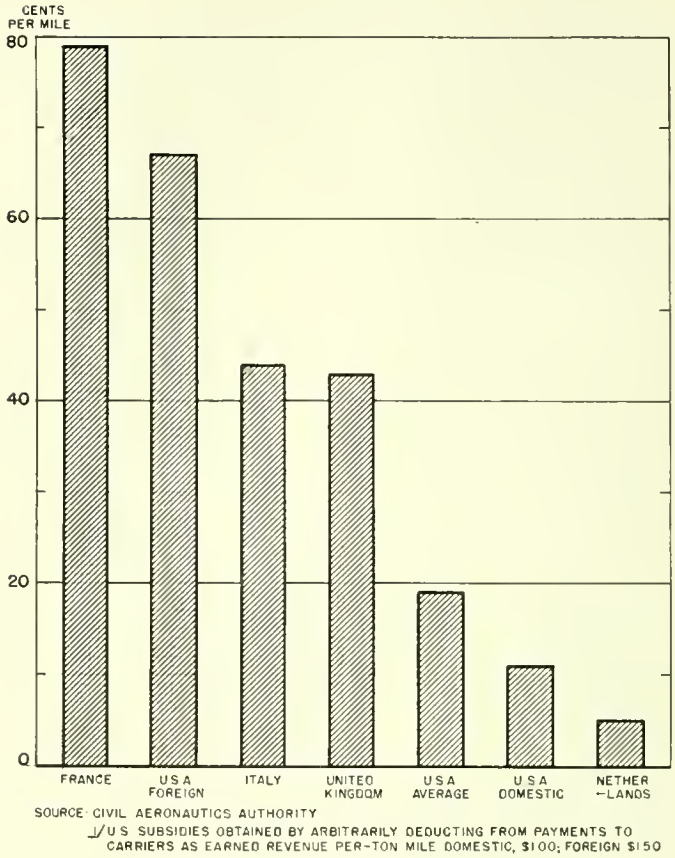

FIGURE 37.—Air Transport Subsidies per Mile Flown, United States and Principal European Countries, 1938

The nature of this so-called "subsidy" element is often misunderstood. Sometimes a carrier's entire revenue from the Government is referred to as "subsidy." At other times it is assumed that no subsidy element is involved if the Government payments for the transportation of mail do not exceed Government revenues from the postal charges on the mail.

Neither assumption is correct. Subsidy, in the premises, is the amount paid in excess of the usual charges for a given service. Government payments for mail services include a subsidy only to the extent that the sum paid is in excess of a normal compensation for actual mail services rendered. The fixing of this element of direct aid so as to expedite and not retard the progress of the air transport industry toward an economically sound and stable condition is an important responsibility of the Civil Aeronautics Board.

That the subsidy element in domestic air-mail payments has, on the whole, been considerably less than in most other countries may be seen in Fig. 37. France, Italy, Great Britain, and many other foreign

[61] See Report by the Joint Committee on Civil Aviation of the U. S. Department of Commerce and the American Engineering Council, 1926, from which stemmed the first civil air legislation. The promotion of civil aviation, the committee stated, was predicated upon three underlying principles: "*first*, the development of commercial uses of aircraft is of great importance industrially and to the national defense; *second*, air navigation should and can be developed primarily as a constructive agent for the public welfare; *third*, the provision of essential air navigation facilities is a public responsibility."

[62] Airport Survey, H. Doc. No. 245, 1939, 76th Cong., 1st sess. (See also Federal Coordinator, "Public Aids to Transportation," 1940, vol. 1, p. 108.) "The primary national interest in airports is an interest in the development of air commerce and in the use of aircraft in the national defense. Quite apart from the very great interest that they have for the people of their own community, airports are a necessary instrumentality for the efficient maintenance of the swiftest possible communication system. It is indispensable that there be an adequate number of airports of such quality as to receive the largest and most efficient of transport aircraft, and so spaced as to permit of easy operation between them along the major trade routes of the Nation.

"Airports serve the national defense directly by providing auxiliary bases for military aircraft in periods of concentration that would overflow the operating capacity of such purely military fields as are locally available. They serve also as intermediate servicing points in the movements of military units across country. Beyond that is the indirect service rendered in providing opportunities for the training of pilots and in making it easy for pilots already trained to keep in practice. Wide dispersion of airports over the extent of the Nation is almost a prerequisite to the initial success, and certainly to any lasting military utility, of a pilot-training program.

"The existence of airports also makes possible the existence of the aircraft industry, as both an economic and military asset." P. xviii, Airport Survey Summary.

[63] Robert H. Hinckley, at U. S. Conference of Mayors, September 22, 1940.

countries, have underwritten their air transport enterprises at much higher unit cost.[64]

The element of direct aid is naturally higher per mile flown on foreign routes operated by United States carriers, than on the domestic system. This is due in large part to the many differences between the two systems, brought out in the preceding sections, such as: operating characteristics, traffic density, investment in airway facilities, and other factors.

Current Problems

Assuming that air transportation should be developed to the full extent outlined in section III above, what are the principal problems with which the Government would be faced?

In the first place, a substantial expansion of the present air transport network will be essential. The continued growth of passenger traffic will require many more schedules on existing routes, and numerous route extensions. The adoption of a policy to forward the greater part of all non-local first-class mail by air will necessitate a considerable increase in the number of pick-up and delivery routes. To develop fully potential commodity traffic, low cost cargo planes designed for mail and express exclusively will be needed.

Changes in the corporate structure of the industry will depend on the degree to which competition is to be fostered or restricted. The development of the industry through a multiplicity of carriers may prove much more costly to the Government than would a more intensive development. Some degree of competition, however, appears essential to economical and efficient management.

There are a number of disadvantages which appear to be inherent in the method presently employed for determining Government payments for transporting air mail. Rates are fixed for each carrier independently by routes and specific schedules and vary not only among the carriers, but also somewhat according to the economic outlook at the moment the decision is made; fixed rates in an industry so subject to change require frequent revision, hence there are numerous and protracted hearings; setting rates by rigidly forecasting future revenues is inherently inaccurate in the premises and cannot be easily corrected, particularly if they are unduly high. Rates can, of course, be reduced but this procedure takes time and decreases are not usually retroactive.

Control of passenger and express rates has been left largely in the hands of the airlines and many inconsistencies have resulted. Yet the rates which the carriers charge the public for other classes of service cannot be dissociated from the problem of fixing air mail rates. They are alternative methods of affecting gross income and must be made to work harmoniously. Consideration should be given to fixing passenger and express rates at optimum levels consistent with the basic policy for the industry.

These are some of the problems with which Government agencies are faced in carrying out their statutory duty to "encourage and develop an air transportation system properly adapted to the present and future needs of the foreign and domestic commerce of the United States, of the Postal Service, and of the national defense."

[64] The service-compensation rates allowed in deriving the proportion of U. S. mail payments representing direct aid, as shown in Fig. 37, are wholly arbitrary. In the fiscal year 1940, for example, the direct-aid element in the mail pay to domestic carriers was 11.4 cents per aircraft-mile flown, only on the arbitrary assumption that $1 per mail ton-mile was a fair haulage compensation rate. Had a rate of 50 cents per ton-mile been used, the corresponding subsidy element would be equivalent to 15.3 cents per plane-mile. See also J. Parker Van Zandt, *op. cit.*, pp. 45–52.

AIR TRANSPORTATION AND THE NATIONAL INTEREST

In the preceding sections we have considered the nature of air transportation, the elements of growth which it has revealed, its economic characteristics and its possible expansion, under favorable conditions, within a reasonable future. The realization of these possibilities will depend upon the adoption by the Government of a systematic program to develop domestic and foreign air transportation to its full capabilities, including forwarding first-class mail by air wherever it can thereby be expedited; the extension of postal, commodity, and passenger service to a greatly increased proportion of the important communities in the country; a reduction in passenger and commodity charges; and on other factors.

These questions, however, are subordinate to a much more fundamental issue. The paramount interest today is the National Defense.

Recent world events have forced the United States to embark on a huge rearmament program which will take years to complete and will cost thousands of millions of dollars. Dislike it as we may, the stark realism of events allows us no other choice.

One inescapable lesson of the conflict to date is the tremendous importance of aviation in such a program.[65]

[65] See recent address by the Hon. Henry L. Stimson, Secretary of War: "Air power today has decided the fate of nations. Germany with her powerful air armada has vanquished one people after another. On the ground, large armies have been mobilized to resist her, but each time *it was that additional power in the air that decided the fate of each individual nation.*" [Italics ours.]

Pilots, mechanics, transport aircraft, and all the resources of a great civil aviation industry are now recognized as integral elements in modern defense.

The basic issue may be stated thus: How can air commerce be most effectively organized and developed to make the greatest possible contribution to the National Defense?

Fundamentally, the most effective peacetime contribution of air commerce is to create and maintain continuously in training the greatest possible reservoir of pilots, mechanics, transport aircraft, and productive facilities.

The country is now engaged, at a cost of many billions of dollars, in a great recruiting and aircraft procurement program, including the production of many hundreds of transport aircraft and the training of many tens of thousands of ground and flying personnel. Much of this equipment and personnel, when not actually required for emergency defense purposes, can be most economically and effectively employed in developing the air transportation potentialities outlined in the preceding sections.

To maintain instantly available for any emergency an equivalent reservoir of planes, pilots, and mechanics on a full-time military basis would probably represent a net additional cost to the Government of well over $200,000,000 annually.[66]

This is without giving any weight to the additional immense postal and commercial benefits which would result from the intensive development of air transportation. It is possible that the establishment of an integrated national air transport network might lead to mass acceptance of air travel on a scale not yet even remotely approached. It would provide an enlarged commercial rather than primarily a military future for personnel in aviation training. It would encourage the establishment of airports and provide a tremendous impetus to private and other non-scheduled flying at the several thousand communities served by the air lines. It would provide a support for the enlarged manufacturing industry and stimulate the production of improved aircraft; and it would contribute importantly to making the country the greatest air power in the world.

The importance, in the premises, of energetically mobilizing the air commerce resources of the United States is obvious to all. No one can foretell, however, what this may ultimately mean in terms of collateral benefits and human relationships. Flying represents a fundamental revision in the ways of mankind, an open sesame to a new world. A transportation policy which did not take this basic fact fully into consideration would represent an inexcusable neglect of the national interest.

[66] In recent years the number of air line personnel has increased about half as fast as the ton-miles of traffic. If, as table 12 suggests, gross traffic expands some twelvefold, pilot and ground personnel might be roughly 6 times present levels or approximately 60,000. At an average salary and living expense of, say, $2,500 per person, the personnel cost on a military basis would be about $150,000,000 per annum. Depreciation, fuel, and maintenance costs for 2,000 to 3,000 troop transport and feeder planes would total in excess of another $100,000,000.

PART II—SECTION II
COASTWISE, INTERCOASTAL, AND GREAT LAKES SHIPPING

Prepared by the Division of Economics and Statistics, U. S. Maritime Commission

Introduction

The extended coast line of the United States, its many natural harbors, and the consequent accessibility of large sections of the country, particularly in the most thickly populated regions, to deep-sea transportation have had as their natural result the development of sea-borne commerce as a major integral part of the Nation's transportation system.

This deep-sea traffic comprises two interrelated but distinctly separate elements: On the one hand, sea-borne traffic between the United States and foreign countries, and between the continental United States and its offshore possessions; and on the other hand, traffic between different parts of the continental United States itself. To a large extent, the ships which are the media of transport in both classes of traffic are readily interchangeable, at least in the physical sense, i. e., disregarding such restrictions as the coastwise laws which prevent foreign-flag shipping from engaging in the coastwise traffic. This interchangeability constitutes the essential link between the two.

There is, however, a distinction of an essential character: In the case of the foreign and offshore (noncontiguous) traffic, deep-sea transportation constitutes, if not in all cases the sole means, at least an essential link in the means of shipment from origin to destination (with the relatively minor exception, of course, of traffic susceptible of economic carriage overseas by air). In the case of coastwise and intercoastal traffic, however, deep-sea transportation is, with possible minor exceptions, merely one of several possible alternative means of transportation. Thus our coastwise, intercoastal, and Great Lakes shipping constitutes a part of the national transportation structure in a more close and exact sense than our foreign and offshore shipping. The latter, indeed, is more a projection of, rather than an integral part of, the national transportation system. This distinction is heightened, moreover, by the fact that our foreign commerce is carried in large measure by foreign-flag shipping, and whatever the flag, at origin or destination this commerce touches a foreign country. In consequence, the problems affecting our offshore and foreign deep-sea shipping are of a special and distinct nature, far less closely related to the transportation problems of the continental United States than is true of our coastwise, intercoastal, and Great Lakes shipping.

At the same time, however, it is essential that, while concentrating attention on this part of our deep-sea shipping, which is an integral part of our national transportation system, due consideration be given to its close relationship to that portion of our shipping engaged in offshore and foreign commerce, which is inherent in the substantial measure of physical interchangeability between the two. It is noteworthy that one of the leading, if not in fact the dominant, reason for the policy of restricting coastwise sea-borne commerce (including intercoastal and Great Lakes traffic not touching foreign ports) to shipping documented under the United States flag is to provide a reservoir of national deep-sea shipping to be drawn upon in emergencies for overseas use. This purpose is clearly an essential factor which must not be neglected in considering the relationship between the deep-sea and other portions of our strictly national transportation system, and policies relating to the deep-sea portion.

Before leaving the subject of noncontiguous and foreign shipping, therefore, it is useful to compare its size with that of our coastwise, intercoastal, and Great Lakes shipping. This is graphically shown in table 1, a summary tabulation of ships of 1,000 or more gross tons each, classified by their employment.

TABLE 1.—*American Steam and Motor Vessels of 1,000 Gross Tons or More Available for Service in Deep-Sea and Great Lakes Trades on Specified Dates in 1930, 1940, and 1941*

Employment	Dec. 31, 1930		Dec. 31, 1940		June 30, 1941	
	Number	Gross tons	Number	Gross tons	Number	Gross tons
Coastwise	450	2,035,483	516	2,945,741	450	2,666,464
Noncontiguous	45	213,992	69	380,393	119	613,754
Intercoastal	198	1,240,968	125	745,266	94	573,674
Great Lakes	553	2,515,394	476	2,391,000	476	2,391,000
Total	1,246	6,005,837	1,186	6,462,400	1,139	6,244,892
Of which:						
Tankers	227	1,443,043	335	2,305,784	310	2,170,866
Dry Cargo	1,019	4,562,794	851	4,156,616	829	4,074,026
Foreign, total	572	3,529,370	378	2,434,408	471	2,816,141
Of which:						
Tankers	96	666,909	38	283,207	70	473,949
Dry Cargo	476	2,862,461	340	2,151,201	401	2,342,192
Laid-up, total [a]	512	2,574,065	139	721,185	31	138,392
Of which:						
Tankers	54	348,212	12	67,467	2	8,573
Dry Cargo	458	2,225,853	127	653,718	29	129,819

[a] Exclusive of Great Lakes which in 1940 and 1941 had no idle tonnage.

Source: U. S. Maritime Commission Reports No. 300 and No. 3148, and Lake Carrier Association Reports.

Inventory of Coastwise, Intercoastal, and Great Lakes Transport

Natural Resources as Aids to Shipping

An inventory of our domestic water transportation system begins with the geographical facts which determine its scope.

Total mileage of ocean and Great Lakes coast line.—Measuring 11,936 miles, the tidal shore line of the continental United States presents a varied aspect. The Atlantic coast, with a tidal shore line of 5,565 statute miles, is characterized by a rugged coast line from Maine to New York; and southward of New York Bay, by one that is low and flat, although irregular in character. The Gulf coast has a tidal shore line of 3,641 statute miles, and is somewhat irregular in character. Compared with the Atlantic and Gulf coasts, the Pacific coast, with a tidal shore line of 2,730 statute miles, is generally high and rocky, with a smaller number of natural harbors. The extensive inlet of Puget Sound, the Bay of San Francisco, and the mouth of the Columbia River are the three principal indentations along the Pacific coast.

The Great Lakes system, comprising Lakes Superior, Michigan, Huron, St. Clair, Erie, and Ontario, provide the largest deep inland, fresh-water route in the world. These Lakes, with their connecting channels, form a natural transportation highway with a water surface area of over 95,000 square miles and a total shore line in excess of 8,300 statute miles of which 3,774 miles, including Lake Michigan, are in the United States. With the exception of Lake Michigan, all of the Great Lakes are international waters, the boundary line between the United States and Canada running approximately along the axis of each Lake from a point about 100 miles from the head of Lake Superior to the foot of Lake Ontario, and in the St. Lawrence River to the mouth of the St. Regis, 66 miles above Montreal.

States adjacent to ocean and Great Lakes coast line.—Of the 48 States in continental United States, 28 have an ocean or Great Lakes coast line; 2, New York and Pennsylvania, are adjacent to both the Lakes and tidewater.

The harbors that are located along these waterways vary in size and in their facilities for handling waterborne commerce. Many of the seaports located along the coast have been improved through the deepening and widening of their channels so as to accommodate deep draft vessels. Other seaports have been created artificially through the building of canals and have grown in importance as distributing points for large areas. Houston, Tex., is one of the outstanding examples of a seaport that originally did not have natural access to ocean-borne commerce but which, through the construction of the Houston Ship Channel, has become one of the principal ports of the United States. Because of its access to the sea and its strategic location it has achieved a dominant position as a distributing center for the Southwest.

Ports and harbors.—The total ocean and Lakes commerce of all ports in continental United States, excluding river and intraport traffic, but including imports, exports, coastwise trade, intercoastal trade, canal traffic, and trade with noncontiguous territories, amounted to 328.3 million long tons in 1939. (See table 3.) Twenty[1] ports located on the Atlantic, Gulf, and Pacific coasts and along the Great Lakes accounted for 199.7 million long tons, or 61 percent of the 328.3 million tons handled by all coastal and Lake ports. Of the 20 ports referred to, those located along the seacoasts have controlling depths ranging from 28 feet at Seattle-Tacoma to 47 feet in San Francisco Bay; on the Great Lakes the depths vary from 19 feet at Buffalo to 32 feet at Duluth-Superior. All of the selected seaports can accommodate ocean-going freight vessels of deep draft, and have available extensive facilities for handling and warehousing in-bound and out-bound traffic.

Although foreign trade is essential to the national economy, the share of this trade in the total traffic of seaports in this country is often overestimated. Many ports, such as Philadelphia, Baltimore, Norfolk, Houston, and Los Angeles, handle a greater volume of coastwise and intercoastal than of foreign traffic.

The commerce of the Great Lakes is highly specialized in that it consists principally of the movement of bulk commodities between upper and lower Lakes ports, while general cargo trade is relatively of small volume. The availability of bulk cargoes in large quantities over rather definite routes led to the building of freighters specially designed to handle such cargoes economically and speedily, and all of the principal Lakes ports have been improved to accommodate these vessels.

Bulk freight, whether transported on the Great Lakes or elsewhere by water, is usually moved slowly, the major factor being economy rather than speed. However, on the Great Lakes where distances are relatively short much has been done to facilitate rapid turnaround at the ports through improved loading and unloading facilities. The operators of port facilities and ships on the Lakes cooperate closely in the handling of bulk cargoes. This has resulted in elevators, loading and unloading docks, and ships being coordinated

[1] New York, Philadelphia, Baltimore, Norfolk, and Boston on the Atlantic coast; Houston, New Orleans, Mobile, and Galveston on the Gulf coast; San Francisco Bay, Los Angeles (including Long Beach), Portland, Seattle, and Tacoma on the Pacific Coast; and Duluth-Superior, Toledo, Buffalo, Detroit, Chicago, and Cleveland on the Great Lakes.

in construction to the end that efficiency, economy, and dispatch could be achieved.

The improvement of the Nation's harbors and ports so as to aid the development of domestic and foreign ocean-borne commerce, as well as for the national defense, has long been a policy of the Federal Government. Surveys are made by the Corps of Engineers, U. S. Army, and reports containing their findings are submitted to Congress, which in turn passes upon the various projects and makes the necessary appropriations to carry out the work to be done. Total expenditures by the Government as of June 30, 1940, for new work on seacoast and Great Lakes harbors and channels, since aid was first granted more than 100 years ago, amounted to approximately $871,000,000, while the cost of maintenance has exceeded $344,000,000.[2]

In colonial days, and during the years prior to the Civil War, the population of the country was largely concentrated along the Atlantic seaboard. Commercial and social contacts among the colonies, and later among the several States, as well as with the rest of the world, were dependent almost entirely upon ocean transportation. Cities built along the seacoast became the leading commercial centers and the focal points of cultural activities. Even as new lands opened up and as the Nation expanded westward, the coastal and Great Lakes cities continued to hold prominent positions in the commercial and intellectual life of the United States. New York, Chicago, Philadelphia, Detroit, Los Angeles, to name but five of the largest cities which have more than 12 percent of the total population of continental United States, are all located along the shore lines of great waterways. Even in 1940 the 28 States adjacent to ocean and Great Lakes coast lines with a total population of over 104,000,000 persons, or almost four-fifths of the total population of the country, still had a greater concentration of population per square mile than the rest of the country.

Influence on industry.—Many of the centers of industrial activity in the United States are located in the coastal and Great Lakes regions. Coastwise, Lakes, and foreign shipping bring many basic raw materials long distances at relatively low cost to the seaports and Lakes ports from which they can be distributed to the factories where they are utilized in the manufacturing process. Many of these materials, because of their low price, would not move over long distances unless this economical transportation were available. The movement of iron ore, coal, limestone, manganese ore, bauxite, petroleum, potash, and many other industrial materials, for example, is largely dependent upon water transportation for at least part of the haul from source of production to point of consumption.

The development of industries and the growth of cities contiguous and tributary to the Great Lakes is, perhaps, one of the best illustrations of the correlation of large available supplies of low cost basic raw materials available at considerable distances, with low cost efficient transportation facilities. The discovery of iron ore in the upper Lakes region and the availability of coal and limestone in their relation to the transportation facilities of the Great Lakes undoubtedly were among the principal factors which attracted industry of this region.

The extent to which industrial activity is concentrated in the 28 States adjacent to tidewater and the Great Lakes is illustrated in table 2.

TABLE 2.—*Specified Manufacturing Data for Continental United States and for 28 States Adjacent to Ocean and Great Lakes Coast Lines, in 1939*

Item	Continental United States	28 States	Ratio of the 28 States to continental United States
Number of establishments	184,244	160,734	87.2
Number of salaried personnel and wage earners	8,936,710	8,109,431	90.7
Value of products (add 000)	$56,828,807	$50,812,571	89.4
Value added by manufacture (add 000)	$24,710,565	$22,438,848	90.8

Source: Bureau of the Census—Census of Manufactures, 1939.

Inventory of Vessels

Any inventory of the American merchant marine made today is subject to constant change. Idle ships being brought into active service, active ships moving on to new owners in belligerent zones, numbers of new bottoms speeding down the ways at an ever-increasing tempo—all this means that an inventory of seagoing vessels in our domestic trade will be out-of-date soon after it is taken. The data presented below are as of the dates indicated: in more recent months there have been great changes in consequence of the defense and war emergency situations.

In the coastal waters, on the inland waterways, and on the Great Lakes of the United States ply American-flag ships (enrolled and registered) to the number of 16,000. These include vessels from 5 gross tons to 20,000 gross tons and more—steamships, motor vessels, sailing vessels, barges, and thousands of utility boats. This report will consider only those steamships and motor vessels of 1,000 or more gross tons in the coastwise, intercoastal, and Great Lakes trades of the Nation, and deal with the number, the gross tonnage, the age, the speed, and the personnel of such craft.

Number, tonnage, and age of vessels.—On June 30, 1941, American-flag steamships and motor vessels in the coastwise, intercoastal, and Great Lakes trades to-

[2] *Annual Report of the Chief of Engineers, U. S. Army,* 1940, part 1, vol. 1.

taled 1,051 of which 31 were laid up. Of the 1,020 active vessels, 450 were in the coastwise trades, 94 were in the intercoastal trades, and 476 were on the Great Lakes. This is in contrast with a total of 1,713 vessels in 1930 of which 1,201 were active and 512 were idle. As of June 30, 1941, these vessels represented a total of 5,769,530 gross tons, of which 2,666,464 were in the coastwise trade, 573,674 in the intercoastal trades, and 2,391,000 on the Great Lakes. In the laid-up fleet there were 138,390 gross tons. In 1930 total gross tonnage amounted to 8,365,910, of which 5,791,845 gross tons were active and 2,574,065 were idle. (See table 1.)

On January 1, 1940, there were 1,207 vessels in service, 612 in the coastwise[3] trades, 119 in the intercoastal trades, and 476 on the Great Lakes. Of the total fleet, only 62 were less than 5 years old, 80 were less than 10 years, and 176 were less than 19 years old. Vessels which are today from 19 to 24 years old are ships which came off the ways during the first World War; there are 547 in the coastwise, intercoastal, and Great Lakes trades. The remainder of the fleet consists of older ships, some built as long ago as the 1880's but still giving good performance, of which 313 are on the Great Lakes. The coastwise trades are operating more of the newer ships, while the Great Lakes trades have a preponderance of the older vessels. Most of the intercoastal vessels also were built during World War I. The tabulation shown below gives details concerning each trade group:

Coastwise[a] *(612 Vessels as of Jan. 1, 1940)*

		Percent
Less than 5 years old	43 vessels, or	7.0
Between 5 and 18 years	79 vessels, or	12.9
Between 19 and 24 years	402 vessels, or	65.7
Between 25 and 29 years	52 vessels, or	8.5
30 years and over	36 vessels, or	5.9
Total	612 vessels, or	100.0

[a] Includes approximately 75 vessels in non-contiguous trade.

Intercoastal (119 Vessels as of Jan. 1, 1940)

Less than 5 years old	5 vessels, or	4.2
Between 5 and 18 years	---	----
Between 19 and 24 years	100 vessels, or	84.0
Between 25 and 29 years	10 vessels, or	8.4
30 years and over	4 vessels, or	3.4
Total	119 vessels, or	100.0

Great Lakes (476 Vessels as of Jan. 1, 1940)

Less than 5 years old	14 vessels, or	2.9
Between 5 and 18 years	68 vessels, or	14.3
Between 19 and 24 years	45 vessels, or	9.5
Between 25 and 29 years	36 vessels, or	7.6
30 years and over	313 vessels, or	65.7
Total	476 vessels, or	100.0

[3] Includes approximately 75 vessels in noncontiguous trade.

Speed of vessels.—The American merchant fleet is comprised of some ships which creep along at 7 knots an hour—others which speed along at more than 20 knots an hour. The fastest, of course, are the combination freight and passenger vessels of modern construction; the slowest are ships which have seen 50 or more years of service. Most of the faster vessels, including the fastest ship of the entire fleet which has a speed of 24 knots, are in the coastwise trades, although the intercoastal runs also operate a considerable number of ships that make good speed. The tabulation given below sets forth the speed groupings in the coastwise and intercoastal trades:

Coastwise (612 Vessels as of Jan. 1, 1940)

		Percent
8 to 9½ knots	119 vessels, or	19.4
10 to 12½ knots	392 vessels, or	64.1
13 to 16½ knots	85 vessels, or	13.9
Over 16½ knots	16 vessels, or	2.6
Total	612 vessels, or	100.0

Intercoastal (119 Vessels as of Jan. 1, 1940)

8 to 9½ knots	7 vessels, or	5.9
10 to 12½ knots	92 vessels, or	77.3
13 to 16½ knots	20 vessels, or	16.8
Over 16½ knots	-- vessels, or	--
Total	119 vessels, or	100.0

The Great Lakes trades differ from the others in that speed is not of paramount importance in the operation of bulk carriers, the type of vessel which predominates in this region. The major factor is economy, and distances being relatively short between ports it is much more important to have efficient loading and unloading facilities to assure quick turn-around in port than to have excess speed for travel between ports. Thus, 95 percent of the 459 bulk carriers (dry and tanker) on the Great Lakes make only 9 to 10 knots per hour; a few of the remainder are good for as high as 12 knots per hour. Some of the 17 Lake combination and passenger vessels are capable of speeds up to 18 knots per hour.

Type of vessels.—Many kinds of vessels are needed to carry on the varied activities of the American merchant marine in its transport of commodities and passengers. They fall into three principal groups—dry cargo freighters, tankers, and combination dry cargo and passenger vessels.

Of the 1,108 American-flag vessels available for service in the coastwise, intercoastal, and Great Lakes trades on March 31, 1941, 736 were dry cargo vessels, 325 were tankers, and 47 were combination vessels.

Most of the dry cargo freighters are found in the Great Lakes trades; most of the tankers in the coastwise trades. Combination vessels represent but a small

portion of the total fleet. In the intercoastal trade 107 out of 115 vessels were dry cargo freighters. Details of each trade are shown below:

	Dry cargo	Combination	Tanker	Total
Coastwise	194	29	294	517
Intercoastal	107	1	7	115
Great Lakes	435	17	24	476
Total	736	47	325	1,108

Personnel of vessels.—The total number of employees engaged in operating vessels of 1,000 or more gross tons in the coastwise, intercoastal, and Great Lakes trades amounted to 43,400 men in 1940, an over-all increase of 11.9 percent over 1938. In the intercoastal and coastwise trades, however, employment in 1940 was lower than in 1938 and 1939, while employment on the Great Lakes increased greatly. Of the 43,400 men employed in 1940 there were 24,100 in the coastwise trade, 5,200 in the intercoastal trade, and 14,100 on the Great Lakes as compared with 22,500 in foreign trade. Compensation of employees in the coastwise, intercoastal, and Great Lakes trades amounted to 75.6 million dollars in 1940, almost 30 million dollars above the 1938 figure and nearly 20 million dollars above 1939.

Corporate and service status of vessels.—Most of the companies owning or operating vessels of the American fleet are independent concerns—that is, they seek business outside the limits of their own corporate structure. Of these a comparatively small number are railroad-owned lines such as Chesapeake Steamship Co., the Peninsular & Occidental Steamship Co., the Central Vermont Transportation Co., and the Ocean Steamship Co. of Savannah operating coastwise; and the Nicholson-Universal Steamship Co. operating on the Great Lakes. Still other companies, notably the large petroleum producers, such as Standard Oil, Atlantic Refining, Sun Oil, and Tide Water Oil, operating huge tanker fleets, carry cargo only for their own private account.

There are three classes of carriers engaged in water transportation, namely, common and contract carriers, which constitute the "for-hire" carriers, and the private carriers. Generally speaking, a common carrier is one which publishes its rates, seeks business generally and accepts such business whenever or by whomever offered up to the limits of its facilities or its operating capabilities. A contract carrier is one which accepts business under contract, charter, or other form of agreement. A private carrier, as its name implies, transports the cargo of its owners and is therefore what may be termed a "proprietary carrier." The question of whether particular vessels are engaged in common or contract carriage is a matter of interpretation in the light of statutory definitions governing or, in the absence of statutory definitions, in the light of common law definition. There have been variations in the statutory definitions as between the different regulatory acts applicable to transportation by water.

Of the entire 1,665 vessels in the American fleet on March 31, 1941, 805, or about 50 percent, were in the common carrier category, of which 246 were in the coastwise trades, 132 in the intercoastal trade, and 72 in the Great Lakes trades, as compared with 355 in the foreign trade. About 25 percent of the total fleet operated under a contract or private carrier status, 437 in the coastwise trades, 2 in the intercoastal trade, and 280 on the Great Lakes. Approximately 10 American vessels in the noncontiguous trades operated as contract or private carriers; practically none in the foreign trades. Some intercoastal common carriers operated as contract carriers in the reverse direction.

Port Terminals and Terminal Facilities

An essential part of the coastwise, intercoastal, and Great Lakes transportation system consists of terminal facilities, which to a large extent are used in common or interchangeably with the foreign trade.

Types of terminals.—Port terminals can be classified both by construction and by use into several different categories. Structurally, the general classification might be (1) pier, and (2) shore wharf.

A pier, generally speaking, is a water terminal constructed either of pile and timber or of reinforced concrete whose longest dimension is vertical to the shore line, whereas a shore wharf is a water terminal constructed of similar materials whose longest dimension is parallel with the shore line. Both types of facilities can be subdivided into two classes, namely: (1) Open (i. e., those without superstructure) and (2) shedded.

As a rule general cargo terminals at United States ports are of the pier type of construction upon which are erected transit sheds of one or two stories. Principal exceptions to the pier type of construction are found at New Orleans, La., Houston, Tex., Oakland, Calif., and Portland, Oreg., and at some river ports, for example, Wilmington, N. C., Tampa, Fla., Lake Charles, La., and Corpus Christi and Brownsville, Tex., where the shore type of wharf is used.

Due to similarity in methods of handling offshore cargo between ship and shore—namely by ship's gear alone or by such gear in conjunction with cargo masts attached to transit-shed roof—overseas and intercoastal vessels frequently use the same terminals, particularly at publicly owned ports. However, at ports whose berthing facilities are privately owned and operated, intercoastal and offshore lines frequently own or lease

and operate their own terminals. On the Atlantic and Gulf coasts, coastwise terminals are generally owned or leased directly from their owners by the coastwise steamship companies, whereas on the Pacific coast, due to ownership of the waterfront by State or local port authorities, coastwise lines are obliged either to sublease or to obtain berth privileges from such authorities. Coastwise cargo is handled by means of hand or motor trucks through side ports or side hatches at the majority of Atlantic and Gulf ports, although on the Pacific coast coastwise carriers load and discharge by means of their own gear.

Bulk cargo terminals, as the name implies, are designed and equipped to handle, in the most expeditious manner, commodities such as ores, grain, coal, sulphur, fertilizers, petroleum, lumber, stone, and sand and gravel which are water-borne usually in full cargo lots. Such terminals may be either the pier or shore-wharf type without superstructure and are usually equipped with mechanical devices to expedite loading or discharge. Barge and lighter terminals are constructed to provide the communicating link between ocean terminals, on the one hand, and railroads and inland waterways, on the other. They are generally the open-pier type with shallow water alongside and may be either open or shedded depending upon the type of cargo and craft that they were designed to handle.

Shipbuilding and repair terminals, which may be either of pier or shore-wharf construction depending upon the amount of water area available, are, as a general rule, without superstructure and used solely in conjunction with the building, outfitting, or repairing of water craft.

Piers used solely for the purpose of bunkering oil are the exception rather than the rule at United States ports, since most of the larger terminals at American ports are equipped with pipe lines permitting ships to bunker at their discharging or unloading berths. Bunker oil may also be furnished at piers of the principal oil companies where petroleum and petroleum products, in bulk, are received or shipped.

Ships burning coal for fuel, unless bunkered at berths by coal barge, are generally required to go alongside terminals specially equipped to provide bunker coal.

Plant and industrial terminals, as the name implies, are used solely by their owners or operators in conjunction with the industry at which they are located for receipt of raw materials and for shipment of the finished or semifinished product. Ferry terminals can be broadly classified into two types: railroad car and passenger and vehicular. In both cases terminals are merely used as a connecting link between water-interrupted land-communication systems and consist of Y-shaped slips constructed of heavy piling and wood or metal sheathing. Many of the larger United States ports have areas set aside solely for the use of outfitting fishing craft, repairing nets, and receiving the catch. In the case of some of the Northwest Pacific ports these terminals are of sizeable dimensions, whereas other ports have provided basins with smaller piers and wharves. Most fish harbors have cold storage facilities adjacent to or near them.

Facilities for Handling Specialized Commodities on the Great Lakes

A large part of Great Lakes terminals are specially designed and equipped to handle bulk caroges such as iron ore, grain, stone, and coal. Iron ore, which contributes the greatest volume of Great Lakes traffic, moves from the northern end of the Lakes from Duluth-Superior, Two Harbors, Ashland, Marquette, and Escanaba to Chicago, Gary, and Indiana Harbor, at the lower end of Lake Michigan; to the Rouge River at Detroit, and to Toledo, Cleveland, Conneaut, Lorain, Huron, Erie, Ashtabula, and Buffalo on Lake Erie. Loading facilities at upper Lakes ports consist of long high piers equipped with bins or pockets into which ore is dumped from specially designed cars brought direct from the mines. Bulk carriers with wide hatches are berthed alongside these piers in such manner that bins match hatches, trap doors in the bottom of the bins then being opened to permit ore to flow in. At lower Lakes ports unloading gear generally consist of electrically operated ore unloaders, equipped with buckets ranging in capacity from 5 to 17 tons, those of the larger type being capable of discharging a 10,000-deadweight-ton vessel in from 3 to 4 hours. These unloaders are usually operated in batteries of from 4 to 6 located on tracks at shipside permitting an entire battery to be used simultaneously on one ship.

The direction of the Great Lakes coal movement is the reverse of the ore movement, namely from Lake Erie ports to ports on Lakes Superior and Michigan. Vessels down-bound with ore and grain are generally used to transport coal on the return trip to the upper Lakes. Equipment for vessel loading at lower Lakes ports is usually of the car-dumper type. Loaded cars are rolled down to a pit by gravity whence they are drawn by cable up to a dumping platform and clamped to a cradle. They are then raised and inverted, dumping the contents into a pan, whence the coal travels by telescopic chute into the vessel's hold. Unloading equipment at upper Lakes ports consists of electrically operated traveling bridge cranes equipped with clamshell buckets of from 5 to 12 tons capacity which can discharge vessels at the rate of from 250 to 600 tons per hour.

The grain movement on the Great Lakes follows quite closely the course of the ore movement except in the case of Chicago and Milwaukee which also are shipping ports. Principal ports of shipment are Port Arthur-Fort William, Ontario, Duluth-Superior, Milwaukee, and Chicago, while Buffalo, Kingston, Montreal, Port Colborne, Prescott, Goderich, Midland, Sarnia, and Toronto are the principal ports of discharge. Grain from secondary elevators in the interior is received by rail at upper Lakes ports. Cars are discharged into receiving bins at the land side of the elevator whence the grain is lifted by conveyor system into the elevator to be cleaned, dried, sorted, and stored. It is loaded into bulk carriers by gravity. At lower Lake ports grain is unloaded by marine legs, either of the pneumatic or endless-belt type, which are lowered into ship's hold. These legs lift the grain to a gallery located on a pier or shore wharf in which is located an electrically operated endless belt which, in turn, lifts it into the receiving elevator. Here it is dried, cleaned, sorted, and stored. From lower Lakes elevators grain travels by three routes to the seaboard: (1) by small lake carriers capable of navigating the St. Lawrence River Canal system to ocean ports on the St. Lawrence; (2) by canal barges through the New York State system of inland waterways to Albany or New York City; and (3) by rail to Boston, Philadelphia, Baltimore, and Hampton Roads ports.

The greater part of the movement of stone on the Great Lakes originates in Alpena, Calcite, and Port Huron, Mich., at the upper end of the Michigan peninsula. For the carrying of this type of cargo a special self-unloading type of ship has been developed. Stone is loaded by gravity and is unloaded at the principal ore-unloading ports by ship's gear.

Handling of package freight on the Great Lakes is similar to that on the Atlantic Coast. The ships, equipped with side ports, are loaded and discharged by means of hand or power trucks.

Bulk Terminals at Seacoast Ports

The preponderant part of the coal traffic, water-borne along the seacoast of the United States, travels between Norfolk, Baltimore, Philadelphia, New York, and Boston in ocean-going coal colliers or by towed barges using either the open ocean or Chesapeake Bay in connection with certain segments of the Atlantic Intercoastal Waterway. Loading equipment at Norfolk and Baltimore is similar to that utilized on the Great Lakes, namely, car dumper and gravity. Unloading facilities at ports of discharge are likewise similar to lake-port equipment, consisting of electric-power hoists and traveling-bridge cranes equipped with clam-shell buckets.

The coastwise movement of grain is very limited, the only considerable movement being between the Pacific Northwest and California ports. Handling facilities at these ports follow the same design as those on the Great Lakes.

Practically all the sulphur entering into the coastwise and intercoastal trades reaches seaboard at Freeport and Galveston, Tex., and Port Sulphur and New Orleans, La. The method of handling from stock pile to ship is by means of endless-belt conveyor and gravity chutes, whereas the unloading facilities consist of power hoists with clam-shell buckets which discharge to endless-belt conveyors leading to stock piles.

The largest coastwise movement of fertilizer material consists of phosphate rock which originates in Florida and enters water-borne traffic at Tampa and Port Tampa, Fla. Loading equipment consists of elevators and endless-belt conveyors, the rock being dumped from railroad cars onto conveyors, thence raised to elevators and dumped by gravity to vessel hold. The bulk of the coastwise movement of phosphate finds destination at Wilmington, N. C. Equipment consists of unloading towers equipped with clam-shell buckets and endless belt conveyor systems leading to stock piles or to factory.

Shipments of petroleum in bulk are handled almost exclusively between loading and discharging terminals owned and operated by the several oil companies. These terminals consist of T-head piers on which are located pipe lines leading to storage tanks, the oil being forced in or out of water carriers by steam pumps located at ship side.

The greatest intercoastal movement of lumber is from the Northwest Pacific coast ports to the entire North Atlantic range, and the greatest coastwise movement is from the same sources to California ports, principally San Francisco Bay and Los Angeles. Most of the lumber in the intercoastal trade is carried either in full cargo loads or as deck cargo on the intercoastal carriers and is handled between ship and pier by ship's gear. In the Pacific coastal trade, lumber is handled almost exclusively by small coastwise steamers and schooners in full cargo lots. Handling equipment on shore at most lumber terminals consists of electric bridge cranes and special-type lumber carriers.

The bulk of the coastwise movement of sugar originates in Hawaii and Puerto Rico, that from the former going largely to San Francisco Bay ports and from latter to Baltimore, Philadelphia, and New Orleans. Sugar is handled in bags, the size of which depends upon its origin, and is loaded and discharged in sling loads by means of ship's gear. Most sugar refinery berths are equipped with special scales and endless-belt conveyor systems leading to stock storage sheds or direct to refinery.

One method of coastwise transportation which has received increasing attention in recent years is the ocean car ferry. The shore facilities for handling this type of ship consist of a shore wharf equipped with a heavy-duty, electrically operated elevator which lifts railroad cars in a cradle from tracks alongside into the ship's hold. Traffic on these carriers between the Gulf ports of Texas City and New Orleans on the one hand, and New York on the other, increased yearly since their inception. They are also equipped to handle fuel oil in bulk in tanks between their outer and inner skins.

Facilities for Interchange Between Other Modes of Transportation

At all principal ports of the United States, piers and wharves accommodating oceangoing vessels are, in most cases, equipped with flush or depressed rail tracks at shipside, within the transit shed, or at the rear of transit shed. Such tracks usually connect either by belt-line railroads or interline-switching arrangements with all rail lines serving the ports. Apron tracks afford direct transfer of cargo between car and vessels and are utilized principally in handling bulk cargoes. Tracks within terminal sheds or at their rear minimize trucking distance from cars to assembly points in the sheds, thus expediting movement and permitting handling of perishable cargo in inclement weather.

The increasing importance of the motor carrier in conjunction with water-borne traffic has resulted in revision in the design of modern marine terminals in order to facilitate the flow of traffic. This revision has been concerned chiefly with the widening of avenues of approach and of traffic aisles on facilities. At the present time it is estimated that this method of transportation carries approximately 65 percent of coastwise and intercoastal cargo to and from terminals. This includes cargo both for local pick-up and delivery, and that traveling between ports and points of origin or destination within a radius of 100 miles.

At seaports served by extensive inland waterway systems, notably at New York, Mobile, New Orleans, and San Francisco, inland-waterway carriers usually own or lease and operate their own terminals. Where transshipment between ocean and inland-waterway carriers is involved, particularly on full barge lots, the latter usually go to deep-sea berths for direct handling either to or from oceangoing vessel or pier. In small cargo lots freight may be handled between deep-sea and barge terminals by motor carrier or rail.

Volume of Traffic Handled at Representative Terminals

It is estimated that during normal periods seacoast water terminals, in the aggregate, are not used to more than one-fourth to one-third of their potential cargo-handling capacity. A continuing study being conducted by the Maritime Commission reveals that the following situation prevailed as of June 15, 1941, at the principal North Atlantic, Gulf, and Pacific coast ports:

Terminal facilities at New York were occupied to between 70 and 85 percent of their capacity, greatest concentration of cargo being at lighterage terminals. Percentages at representative piers or groups of piers were as follows:

	Percent
Erie Basin	Approximately 80.
Atlantic Dock	90 to 100.
Brooklyn Terminals	South of Brooklyn Bridge 80.
Bush Terminals	85.
Weehawken	Approximately 60.
North River	75 to 80.

Pier-space employment at Boston for all piers averaged about 33⅓ percent with the Army Base occupied to about 75 percent of capacity and Commonwealth Terminals to about 25 percent. Of the remaining principal North Atlantic ports, piers at Philadelphia were occupied to about 50 percent of capacity, Baltimore to about 45 percent, and Norfolk to about 33⅓ percent. It is estimated that facilities at New Orleans and Mobile were utilized to only one-third of their potentiality. On the Pacific coast the following percentages of utilization of terminal space prevailed:

	Percent
San Diego	50
Los Angeles	85
San Francisco	75
Oakland	65
Richmond	50
Puget Sound ports	50
Portland	33

Estimated Investment in Coastwise and Intercoastal Terminal Facilities

No complete estimate is known of total investment in terminals used exclusively to handle coastwise and intercoastal traffic. The Federal Coordinator of Transportation in his report "Public Aids to Transportation," vol. III, reported that for land and water terminals at seacoast ports a total of $752,976,692 had been expended as of June 30, 1932. This total, broken down by coastal regions and as between land and structures, is as follows:

Coast	Land	Structures	Total
North Atlantic	$139,440,137	$309,437,144	$448,877,281
South Atlantic	6,115,771	11,896,743	18,012,514
Gulf	58,063,831	55,217,673	113,281,504
Pacific	66,282,313	106,523,080	172,805,393
Total seacoasts	269,902,052	483,074,640	752,976,692

To arrive at a somewhat arbitrary estimate of expenditure on structures and land utilized for coastwise and intercoastal traffic the following method was used: According to the Annual Report of the Chief of Engineers for 1940, average annual water-borne commerce

of all seacoast ports for the 20-year period 1920 to 1939, inclusive, amounted to 296,903,500 short tons, of which 107,487,950 tons were coastwise and intercoastal, the remainder being foreign, internal, local, and intraport traffic. Thus, of the total commerce of United States seacoast ports, coastwise and intercoastal movements represented 36 percent. The resulting ratio of approximately 2 to 1, applied to estimated cost of all seacoast terminals, results in a figure of a little more than a quarter of a billion dollars for the estimated expenditures for coastwise and intercoastal terminals at seacoast ports.

In the report mentioned above, the Federal Coordinator estimated that expenditures for terminal land and structures on the Great Lakes approximated 20 million dollars. Since the greater part of Great Lakes traffic is coastwise, it was believed that expenditures for terminal facilities could be added *in toto*, giving a total of approximately 270 million dollars for coastwise and intercoastal terminal facilities as of 1932. Using an arbitrary factor of 10 percent for expenditures between 1932 and the present time, a grand total approaching 300 million dollars is derived.

Utilization of the Deep-Sea Transport System

Freight Traffic

In 1939 the total movement in the coastwise, intercoastal, and Great Lakes trades amounted to 230 million tons, only slightly below the peak of 248 million tons in 1937 and the 229 million-ton mark of 1929. Between 1929 and 1932 this flow of water-borne traffic declined steadily to a low of 116 million tons, followed by a gradual upswing which today is slightly above the level of 1929. (See table 3.)

Relative importance of various trades.—During the 11-year period, 1929 to 1939, the movement in the coastwise trades represented an average of 40.2 percent (coastal, 35.8; intercoastal 2.7; and noncontiguous 1.7) of the total deep-sea and Great Lakes commerce of the United States; the Great Lakes, 30.1 percent; and the foreign trade, imports 13.4 percent and exports 16.3 percent.

Trends of cargo movement in each of the trades mentioned above reflect, but in varying degrees, the general decline in 1932–33. Some have recovered to a greater extent than others. The most notable increase has been in the coastwise trade, from a low of 74.5 million tons in 1932, to 122 million tons in 1939. Coastwise tonnage in 1929 amounted to only 96.7 million tons. In the intercoastal trade, 1939 tonnage was 1.6 million tons above the 1932 low point, but still considerably below the 10.6 million tons of 1929. Great Lakes traffic in 1939 was the highest of any year in the 1929–39 period.

TABLE 3.—*Summary of Ocean and Lake Borne Foreign and Domestic Commerce of the United States, by Trades, 1928 to 1939*

[In millions of cargo tons of 2,240 pounds]

Calendar year	Domestic commerce						Foreign commerce [a]			Total foreign and domestic
	Coastwise				Great Lakes	Total domestic				
	Coastal	Intercoastal	Noncontiguous	Total	Total		Imports	Exports	Total foreign [b]	
1939	121.8	7.4	5.5	134.7	101.2	235.9	37.4	55.0	92.4	328.3
1938	112.7	5.8	5.1	123.6	65.0	188.6	32.8	55.6	88.4	277.0
1937	120.9	6.9	5.6	133.4	120.3	253.7	42.0	54.6	96.6	350.3
1936	106.3	6.7	5.2	118.2	102.8	221.0	38.4	39.7	78.1	299.1
1935	91.1	7.2	4.8	103.1	74.6	177.7	34.0	38.1	72.1	249.8
1934	88.2	8.5	4.4	101.1	63.9	165.0	29.8	37.8	67.6	232.6
1933	86.9	7.6	4.0	98.5	61.2	159.7	26.6	32.4	59.0	218.7
1932	74.5	5.7	4.1	84.3	35.3	119.6	28.7	31.8	60.5	180.1
1931	90.0	7.3	4.4	101.7	65.1	166.8	35.9	40.0	75.9	242.7
1930	91.5	9.0	4.7	105.2	98.0	203.2	47.6	49.7	97.3	300.5
1929	96.7	10.6	4.3	111.6	121.3	232.9	51.0	57.5	108.5	341.4

[a] Includes imports and exports through Great Lakes ports.
[b] Only one-fourth to one-third carried in American flag vessels.

Sources: Total Atlantic, Gulf, Pacific, and Great Lakes—Data obtained from table 1, p. 4, Commercial Statistics, part II for 1939, United States Army Engineers—Short tons converted to long tons.
Intercoastal and noncontiguous—Data obtained from United States Maritime Commission Report No. 295.
Coastwise—Total Atlantic, Gulf, Pacific commerce (col. 4) minus Intercoastal (col. 2) and noncontiguous (col. 3).
Foreign—Data obtained from United States Maritime Commission, Report No. 99, Annual.

As broadly representative of the cargo movement during the entire decade, 1929–39, attention may be focused upon 1939 for a detailed study of the interrelation of the various segments of domestic water-borne commerce, because it is the latest "normal" year for which complete data are available. Total deep-sea and Great Lakes traffic in 1939 amounted to 328.3 million long tons, of which 37.0 percent moved coastwise, 2.3 percent intercoastal, 1.7 percent noncontiguous, 30.8 percent on the Great Lakes, and 28.2 percent foreign. (See table 3.) The present analysis is confined to coastwise, intercoastal, and Great Lakes movement. Each will be discussed separately with respect to volume, direction of movement, and principal commodities peculiar to each trade.

Trade segregated by geographic areas.—To facilitate analysis of the volume and the direction of flow of commodities in the coastwise movement, statistics have been grouped according to the following geographic areas:

1. New England district: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut.
2. Middle Atlantic district: New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia.
3. South Atlantic district: North Carolina, South Carolina, Georgia, east coast of Florida.

4. East Gulf district: West coast of Florida, Alabama, Mississippi.
5. West Gulf district: Louisiana, Texas.
6. Pacific district: California, Oregon, Washington.

Volume and Direction of Movement of Traffic

Of 121.8 million long tons moved in 1939 in the coastwise trade, 116.7 million tons or 95.8 percent of the total coastwise movement was analyzed as to direction of movement and volume of traffic between different sections of the United States. Of the 116.7 million tons analyzed, 110.5 million tons were shipped from three districts—the West Gulf, the Middle Atlantic, and the Pacific, named in order of importance. (See table 4.) The three principal districts for which 102.3 million tons of the 1939 coastwise traffic analyzed were destined were the Middle Atlantic, the New England, and the Pacific districts. Of this total, 25 million tons moved within these areas, 23 million tons of it between ports on the Pacific coast.

East-bound intercoastal traffic in 1939 was almost double the west-bound tonnage. Of the 25.1 million long tons of domestic water-borne cargo originating on the Pacific coast, 4.9 million tons or 19.5 percent went to Atlantic and Gulf ports, while of the 99.1 million long tons originating on the Atlantic and Gulf seaboards, 2.6 million tons or 2.6 percent went to Pacific ports. (See table 4.)

Movement on the Great Lakes during 1939 amounted to 115.8 long tons of which 8.8 percent were exports, 3.8 percent imports, and 87.4 percent domestic. The greater part of the domestic tonnage moved eastward from the ore and grain centers of the upper lakes.

TABLE 4.—*Analysis*[a] *of Coastwise and Intercoastal Tonnage Originated and Received in American Sea Ports During 1939*

(In thousands of long tons of 2,240 pounds)

	Tonnage originated			Tonnage received		
	Coastwise[b]	Intercoastal	Total	Coastwise[b]	Intercoastal	Total
New England	3,202	117	3,319	25,860	873	26,733
Middle Atlantic	28,290	1,744	30,034	56,145	3,420	59,565
South Atlantic	1,306	84	1,390	6,113	230	6,343
East Gulf	1,694	228	1,922	2,654	64	2,718
West Gulf	61,973	420	62,393	5,693	294	5,987
Pacific	20,246	4,876	25,112	20,246	2,588	22,834
Total tonnage analyzed	116,711	7,469	124,180	116,711	7,469	124,180
Total tonnage moved	121,800	7,469	129,269	..	..	.....

[a] Analysis of coastwise data represents 95.8 percent of total coastwise movement; intercoastal data represents 100 percent of intercoastal movement.
[b] Does not include noncontiguous commerce.

Source: Compiled from data obtained from United States Army Engineers Records.

Although vessels in the coastwise trade are free to ply between any American ports, much of the traffic of several given districts is confined to the seaports within that particular area. Thus, of all outbound cargo from the New England district, 68.2 percent goes to New England ports, 40.1 percent of the outbound cargo of the Middle Atlantic district goes to Middle Atlantic ports, and 77.3 percent of the outbound cargo of the Pacific coast district goes to Pacific coast ports. The principal destination areas of outbound coastwise cargo, by districts[4] follow:

From New England	68.2 percent to N. E.; 21.6 percent to M. A.
From Middle Atlantic	45.7 percent to N. E.; 40.1 percent to M. A.
From South Atlantic	71.3 percent to M. A.; 15.6 percent to N. E.
From East Gulf	57.0 percent to M. A.; 11.0 percent to Pac.
From West Gulf	65.5 percent to M. A.; 15.0 percent to N. E.
From Pacific	77.3 percent to Pac.; 13.1 percent to M. A.

Some districts, such as the New England and South Atlantic, have decidedly unbalanced traffic, receiving much more cargo than is shipped out. Conversely, the Gulf district is unbalanced in the other direction, shipping out much more than is received. The principal originating areas of inbound cargo by districts follow:

To New England	52.0 percent from M. A.; 35.1 percent from W. G.
To Middle Atlantic	68.4 percent from W. G.; 20.4 percent from M. A.
To South Atlantic	82.4 percent from W. G.; 10.0 percent from M. A.
To East Gulf	83.2 percent from W. G.; 8.5 percent from M. A.
To West Gulf	68.1 percent from W. G.; 21.7 percent from M. A.
To Pacific	85.5 percent from Pac.; 7.3 percent from M. A.

The more return cargoes a vessel can obtain the more profitable is its operation. In much of our coastwise and intercoastal trades, return cargoes are generally available, especially for dry cargo package freighters and for combination freight and passenger vessels. In the bulk trades also, ships carrying Oregon lumber from the Pacific to the Atlantic coast can usually take on a cargo of Pennsylvania iron and steel for California on the return voyage. Other bulk carriers are less fortunate especially if their equipment is restricted to special types of commodities as in the case of tankers. For instance, tankers carry a great

[4] For brevity the following symbols are used to designate districts:

N. E.—New England.	E. G.—East Gulf.
M. A.—Middle Atlantic.	W. G.—West Gulf.
S. A.—South Atlantic.	Pac.—Pacific.

volume of petroleum from the Gulf coast to North Atlantic ports, some 60 million tons a year, yet the total return cargoes of all commodities coming into the Gulf ports amount to only one-tenth that volume. Quite a few tankers must return in ballast, except for an occasional deck load of iron pipe or other material in demand in the oil-well districts. On the Great Lakes many of the vessels which bring grain, ore, and stone down from the upper lakes can return with cargoes of coal.

The movement of commodities by water from seaport to seaport along the thousands of miles of United States coast is closely interrelated with other means of transportation, i. e., rail and motor carriers, pipe lines and barge lines which act as feeders or distributors between interior points of production or consumption and the seaboard. Such ocean-borne cargoes can penetrate inland from the seaboard only to those points where overland transportation costs meet the level of seaport-to-seaport plus seaport-to-interior transportation costs can compete with overland transportation costs. Some commodities reach farther inland than others. Bituminous coal from the southern mines of Virginia and West Virginia travels 400 miles to Hampton Roads and thence to tidewater New England where it penetrates about 40 or 50 miles westward until it meets the competition of all-rail coal from the northern mines of West Virginia and Pennsylvania. Petroleum from Texas pipe lines moves north from Gulf ports by tankers and then inland from Atlantic ports for a distance of 200 or 300 miles until it meets competition from petroleum carried by pipe lines and all-rail. Lumber moved by water from the Pacific Northwest to the Atlantic seaboard is carried inland as far as 100 miles before it meets the competition of lumber coming eastward by all-rail overland routes. Many other commodities, such as cotton from the Gulf to New England, phosphate rock from Florida, bulk grain and ore on the Great Lakes, exhibit similar conditions. The competition between water transportation facilities and overland facilities or a combination of both lies along a rather definitely established line of demarcation between territories which each can serve most advantageously, and varying according to the type of commodity offered for movement.

Analysis of the 1939 Commodity Movement

Hundreds of different kinds of commodities comprise the cargoes of the vessels which serve the coastal and Great Lakes ports of the United States and its territories. The nature of these commodities varies with the geographic location of the areas served, with the seasons of the year, and with the economic demands of the population within each area.

Total coastwise commerce of the United States in 1939 amounted to 121.8 million tons, the peak year of a continual rise since 1929. The 20 commodities named in the following list represent 97.4 percent of 118.6 million tons of the out-bound cargo shipped from the various districts comprising the coastwise trade.

Commodity	Thousand long tons	Percent of total	Principal districts of origin [a]
Animals and animal products	198	0.2	M. A., W. G., Pac.
Canned goods	363	.3	M. A., Pac., W. G.
Other food products (edible)	1,860	1.6	Pac., S. A., W. G., M. A.
Vegetable products (inedible)	289	.3	M. A., S. A., E. G.
Textiles	362	.3	M. A., W. G., N. E.
Cotton and linters	195	.2	W. G.
Paper and paper products	714	.6	Pac., W. G., M. A.
Lumber and manufacturings of	2,560	2.2	Pac., S. A., E. G., W. G.
Wood pulp	111	.1	Pac., S. A.
Coal and coke	15,807	13.3	M. A.
Petroleum and products	85,185	71.8	W. G., Pac., M. A.
Sand and gravel	2,940	2.5	M. A.
Sulphur	1,021	.9	W. G.
Phosphate, pebble	1,126	.9	E. G.
Nonmetallic minerals, n. o. s.	532	.4	Pac., W. G., M. A.
Iron and steel	501	.4	M. A., E. G.
Ores, metals and manufactures, n. o. s.	864	.7	M. A., W. G.
Machinery and vehicles	112	.1	M. A., Pac.
Chemicals	610	.5	M. A., W. G.
Fertilizer materials	368	.3	M. A., W. G.
Miscellaneous	2,891	2.4	Pac., M. A., N. E.
Total	118,609	100.0	W. G., Pac., M. A., N. E.

[a] For brevity the following symbols are used to designate districts:

N. E.—New England.
M. A.—Middle Atlantic.
S. A.—South Atlantic.
E. G.—East Gulf.
W. G.—West Gulf.
Pac.—Pacific.

The entire intercoastal movement totaled 7.5 million tons in 1939, of which 4.9 million tons was east-bound and 2.6 million tons was west-bound. The 16 commodities named in the following list comprised 85.6 percent of the total intercoastal traffic during 1939.

Commodity	Thousand long tons	Percent of total	Principal direction
Lumber	1,632	21.8	East-bound.
Iron and steel and manufactures	1,015	13.6	West-bound.
Petroleum and products	1,164	15.6	East-bound.
Fruits and vegetables	838	11.2	East-bound.
Wood pulp	230	3.1	East-bound.
Sugar and molasses	246	3.3	East-bound.
Animal, fish, dairy products	238	3.2	East-bound.
Sulphur	161	2.1	West-bound.
Paper and products	201	2.7	West-bound.
Chemicals	132	1.8	West-bound.
Building materials	108	1.4	East-bound.
Grain products, dry	106	1.4	East-bound.
Fertilizer, n. o. s.	105	1.4	East-bound.
Metals, n. o. s.	78	1.0	East-bound.
Clay, stone, sand, etc.	71	1.0	West-bound.
Manufactured goods	76	1.0	West-bound.
Miscellaneous	1,072	14.4	West-bound.
Total	7,473	100.0	

Total commerce on the Great Lakes in 1939 amounted to 101.2 million tons, 95 percent of which consisted of bulk commodities. Approximately one-half of the bulk tonnage was iron ore; about one-third was coal; grain and stone accounted for the remainder of the bulk cargoes. The principal commodities comprising the package freight traffic were wheat flour, automobiles and trucks, butter, canned goods, and sugar.

Passenger Traffic

Hundreds of thousands of passengers are transported annually on American vessels operating in the coastwise, intercoastal, and Great Lakes services of the American merchant marine. Practically all coastwise passenger movement is along the Atlantic-Gulf seaboard. Although no regular coastwise passenger service was operated on the Pacific coast in 1937, the latest year for which data are available, freight vessels in the service occasionally carry passengers, and foreign vessels sometimes take passengers from California ports to Vancouver, B. C., whence they travel to Seattle, a comparatively short distance. New York is the center of the coastwise traffic, as 938,147 or 57 percent of the 1,639,145 coastwise passengers embarked or disembarked there during 1937. The heaviest movement was between New York and Boston, which included 89 percent of the movement out of New York. The next heaviest movement was to Norfolk and Miami. Boston had the second largest coastwise passenger movement in 1937 with 244,414 passengers, arriving and departing, mostly on the Boston-New York run. Other Atlantic-Gulf ports important in the coastwise passenger traffic in 1937 were: Baltimore, with 166,708 arrivals and departures; Miami, 34,846; Jacksonville, 23,603; Savannah, 17,982; Philadelphia, 11,616 (mostly to Boston); and New Orleans and Galveston, with 7,000 each.

The total intercoastal passenger movement was fairly stable between 1930 and 1937, with west-bound travel amounting to slightly more in each year than east-bound travel. In 1939, however, the total movement fell to 5,676 passengers, less than one-third the average of the previous five years. One of the principal reasons for this decrease in intercoastal passages may be attributed to the withdrawal of several large combination freight and passenger vessels from the intercoastal trade during this period. Analysis of passenger movement from 1933 to 1937 indicates that 96 percent of the intercoastal traffic is between New York and San Francisco and Los Angeles.

During 1940 passenger traffic on the Great Lakes amounted to 8,393,833 arrivals and departures, less than one-third of the 28,226,185 total in 1928. The greatest decline, of course, occurred in the ferry trade following the opening of the Ambassador Bridge across the Detroit river between Detroit and Windsor, in 1929, and the inauguration of the vehicular tunnel between these two cities in 1930. Whereas Great Lakes ferry traffic in 1929 showed 21,287,022 passengers, it amounted to only 8,329,907 in 1931. Ferry traffic in 1940 was below the 4,000,000 mark and represents about 30 percent of the annual lake passenger movement. Excursion traffic amounted to about 2,000,000 passengers and was about one-half the 1929 volume. The regular passenger traffic totaled 2,400,000, slightly below 1929, but double the 1931 and 1933 figures.

Relation of Traffic to Vessel Supply

In 1932, water-borne commerce of the United States in the coastwise, intercoastal, and Great Lakes trades reached a low ebb; the number of vessels in active service was correspondingly low. By 1934, however, definite trends had begun to take shape. The volume of traffic in most trades was rising; the number of vessels was falling. A summary of the changes in volume of commerce during the 1934–39 period and the employment of vessels now as compared with 1934 in each trade shows:

Trade	Volume of commerce	Employment of vessels
Coastwise	Up 38 percent	Up 18 percent.
Intercoastal	Down 13 percent	Down 25 percent.
Great Lakes	Up 55 percent	Down 10 percent.

The number of passengers transported during the 1934–40 period has decreased about 25 percent in the coastwise and intercoastal trades and remained about the same in the Great Lakes trade. The employment of combination vessels declined in all trades, but most notably in the intercoastal and Great Lakes trades.

Adequacy of Present Fleet to Cope with Economic Changes and Fluctuations of Commerce

Adequacy of shipping facilities in the coastwise, intercoastal, and Great Lakes trades depends upon carrying capacity in relation to the amount of cargo available for movement. This will vary with the status of the domestic economy of the Nation, and its relation to the ability of other methods of transportation to absorb increased demands for cargo space arising from withdrawal of ships from these trades.

With the outbreak of the European war in September 1939, the vessels in the intercoastal and coastwise trades, many of which had already approached or were approaching the age of economic obsolescence, were sought by the belligerent and neutral nations alike. In view, therefore, of the rapid withdrawal of vessels some concern was felt by shippers as to the adequacy of the coastwise and intercoastal fleets in these two domestic services.

Generally speaking, for the coastwise, intercoastal, and Great Lakes trades as a whole, the diminishing shipping facilities of these trades have during the last few years been carrying an increasing amount of cargo. How much longer this can continue or where the balance will be struck cannot be anticipated with any precision under today's conditions.

Relation of Rate Structures to Effective Use of Facilities

Differences in Transportation Characteristics of Carriers Requiring Lower Rates for Water Traffic

Water transportation is subject to certain disadvantages which limit the ability of the carriers to obtain traffic in comparison with rail or motor carriers. Among these are: (1) Lesser opportunity for extension of water routes and services due to physical limitations of such routes; (2) circuity of water routes: (3) larger carrying units which lack the uniformity and flexibility which generally characterizes much of the equipment of rail and motor carriers; (4) slower transit time and less frequent and less flexible service; (5) greater susceptibility of water-borne cargo to damage in some instances due to a greater number of physical handlings or transfers en route, such as transfers between vessels and railroad cars or trucks; (6) inability of the water carriers to accord shippers diversion-in-transit, milling-in-transit, and other transit privileges to the same extent as the railroads; and (7) limitations on loading vessels to their available carrying capacity resulting from such things as insufficient channel depths, weather disturbances, and inadequate port facilities.

It is evident that in the face of these disadvantages the water carriers could not hope to compete with the superior services of the land carriers at equal rates. If they are to share in the competitive traffic, the water carriers must have rates below those of their major competitors, the railroads, by differentials or amounts adequate to attract the traffic. Common-carrier water lines operating over regular routes are handicapped, by their regularity of service and type of traffic, in adjusting the use of their facilities to achieve capacity loads, as compared with the bulk cargo carrier.

Common-carrier water lines operating over regular routes must also operate on a port-to-port rate structure lower than the corresponding all-rail rates and must participate in lower joint water-and-rail rates to and from inland points beyond the ports in order to compete successfully for traffic originating at or destined to such points. The amounts by which the water-line rates are lower than the all-rail rates are generally known as differentials. The importance of the joint water-and-rail rates is indicated by the fact that between 50 and 75 percent of the traffic of the common-carrier water lines in the Atlantic-Gulf coastwise trade moves via combined water-and-rail routes.

The justification for such rate differentials is to be found in operating costs which are much less than those of the corresponding railroads, and which enable the water carriers to charge lower rates and thus tend to offset the disadvantages which have been enumerated previously. This ability to charge less and offer shippers a more economical service is one of the primary, if not the most important, reasons for the prominent place occupied by the coastwise, intercoastal, and Great Lakes carriers in our national network of transportation.

General Description of Rate Structures

Port-to-port rates.—Both contract and common-carrier steamship lines in the coastwise, intercoastal and Great Lakes trades, maintain port-to-port rates between all important ports on the Great Lakes, and the Atlantic, Gulf, and Pacific coasts. It is the general practice of the contract-carrier steamship lines to confine their operations to the transportation of bulk commodities in cargo lots. This enables them to effect very low operating costs and maintain rates which are much lower than either common-carrier steamship or rail rates. There are numerous instances where bulk water-borne commodities are carried over long distances so economically that the railroads could not hope to compete. This is particularly true with respect to the transportation of coal, iron ore, grain, and petroleum between Great Lakes ports; lumber between Pacific coast ports; petroleum, sulphur, coal, and phosphate rock between Atlantic and Gulf ports; and petroleum between Pacific and Atlantic ports via the Panama Canal.

The rates of the contract-carrier steamship lines in the domestic trades, which had remained unregulated [5] until the Transportation Act of 1940 caused their regulation by the Interstate Commerce Commission, were based largely on the cost of operation. They were not published in tariff form. It was customary for such contract water rates to fluctuate with the demand for vessel space resulting from commercial or economic conditions, such fluctuations also being affected by the availability of return cargoes, the seasonal movement of commodities, and competition among the contract water carriers. The contract rate method has been highly competitive between such carriers, and the force of this competition has been instrumental in keeping the cargo-lot charges down to a level which readily attracts the traffic, and which is made possible by the efficiency and economy of this particular type of transportation.

Contract-carrier steamship rates, applying as they do to cargo or volume lots, have afforded shippers who

[5] Except intercoastal contract-carrier rates which were regulated to a limited extent under the Intercoastal Shipping Act, 1933, by the U. S. Maritime Commission until such regulation was transferred to the Interstate Commerce Commission, March 1, 1940, under the Transportation Act of 1940.

can offer large quantities considerable savings in freight charges as compared with all-rail charges. For example, the all-rail carload rate on bituminous coal from the New River, W. Va., district on the C. & O. Railway to Boston, Mass., is $5.69 per long ton. The contract-carrier steamship lines operating from the port of Newport News, Va., to Boston maintain a ship-load rate of about 85 cents per long ton between these ports which, added to the rail rate of $2.63 per long ton from the New River district to Newport News and the handling charges at the ports, results in a total rail-ocean charge of $3.98, or a saving of $1.71 per long ton. The all-rail carload rate on iron ore from the Messabi Range in Minnesota to Pittsburgh, Pa., district furnaces is approximately $6 per long ton. The combined rail-lake-rail charge from the Messabi Range to Pittsburgh is about $3.06 per long ton, including an intervening shipload rate of 70 cents a long ton for the 890-mile lake haul from Duluth, Minn., to Conneaut, Ohio, on Lake Erie and the handling charges at these ports, thus effecting a saving in freight charges, under those via rail, of $2.94 per long ton. The importance of low lake rates on iron ore is illustrated by the fact that in 1938 only 1.46 percent of the vast shipments from the Lake Superior ranges used all-rail routes.

Traffic transported by the common-carrier steamship lines in the coastwise, intercoastal, and Great Lakes trade consists largely of general cargo, i. e., package or merchandise freight. Since this same type of cargo also moves via all-rail routes, the principal competition of these steamship lines is with the railroads. Consequently the port-to-port water traffic is generally subject to classifications of freight, rules, regulations, and practices identical with or closely analogous to those which are observed by the competing railroads.

The construction of the common-carrier port-to-port water rates is governed by practically the same economic principles as are applicable to railroad rate making, such as competition, cost and value of service, bulk and weight of commodities, the element of risk and damage, and volume of traffic. The port-to-port rates which apply both to class-rate traffic and to specific commodities in carload and less-than-carload quantities are generally related to and lower than the railroad rates by amounts or differentials which vary with the nature of the commodity, the competition involved, and the length of haul. These rates and differentials are usually fixed by mutual agreement between and voluntary action of the interested water carriers except where prescribed by the action of regulatory bodies.

In a number of instances the port-to-port rates of the common-carrier water lines are made without relation to the length of haul. An example is the so-called blanket basis which prevails in a number of instances, particularly with respect to rates on specific commodities. For instance, the North Atlantic ports from Boston, Mass., to Norfolk, inclusive, are assigned to a so-called group A, and the Texas ports from Beaumont to Corpus Christi, inclusive, are assigned to a so-called group 1, the commodity rate on a given article being the same from all ports in group A to all ports in group 1. On the Great Lakes the class rates from Buffalo to Sault Ste. Marie and Duluth are the same, and in the intercoastal trade the rate on a particular commodity from all Atlantic ports—Jacksonville, Fla., to Portland, Maine, inclusive—to all Pacific ports—San Diego, to Vancouver, Wash., inclusive—is the same. Many of the water carriers engaged in port-to-port operations are voluntarily associated in rate-fixing conferences through which agreements are negotiated for the purpose of effecting the stabilization of freight rates in the interest of shippers and carriers alike.

Joint rates.—Most of the joint rates to and from inland points maintained by the common-carrier[6] steamship lines are made jointly with the railroads. Only the intercoastal lines operating to and from Gulf ports have joint rates with the railroads; they also join in through rates with the Mississippi River barge lines. There are a number of instances where there are joint rates with motor-trucks, but there is no information available which will permit of a concise description of their extent and application.

In connection with the Atlantic and Gulf coastwise trade, joint rail-and-ocean rates are available, with some exceptions, to practically all of the United States east of the Rocky Mountains. Joint rail-and-ocean rates in connection with the intercoastal carriers and applicable only through the Gulf ports are available to a large part of the Mississippi Valley states and some states immediately adjacent thereto. The joint rail-and-ocean rates of the Pacific coastwise carriers penetrate the states of Oregon, Washington, California, and a few points in western Idaho. The Great Lakes carriers participate in joint rail-and-lake rates which reach into the Middle Atlantic and New England states on the East and into the Central Western and Northwestern Pacific States on the West.

It would require extended description to enumerate in detail the scope of the application of all of the various joint rail-and-ocean and rail-and-lake rate structures; the accompanying tabulation supplies a brief description of the routes via and the territory to

[6] No contract carriers participate in joint rates with other types of carriers.

and from which the more important of such joint rate structures apply, in connection with the common carriers in coastwise, intercoastal, and Great Lakes trades.[7]

ATLANTIC AND GULF COASTWISE TRADE

(1) Between North Atlantic ports, on the one hand, and points in Southern[8] and Southwestern[9] territories, on the other hand, over *ocean-rail*, or *rail-ocean* routes, via ocean to or from Norfolk, Va.,[10] South Atlantic or Gulf ports and rail beyond.

(2) Between points in Eastern territory,[11] on the one hand, and South Atlantic and Gulf ports, on the other, over *rail-ocean* or *ocean-rail* routes, via rail to or from North Atlantic ports and ocean beyond.

(3) Between points in Eastern territory,[11] on the one hand, and points in Southern[8] and Southwestern[9] territories, on the other, over *rail-ocean-rail* routes, via rail to or from North Atlantic ports, ocean to or from Norfolk, Va.,[10] South Atlantic or Gulf ports, and rail beyond.

(4) Between North Atlantic ports, on the one hand, and points in Central[12] and Western Trunk-Line[13] territories, on the other, over *ocean-rail* or *rail-ocean* routes, via ocean to or from Hampton Roads ports, Virginia, or Savannah, Ga., and rail beyond.

(5) Between points in New England, New Jersey, Delaware, Pennsylvania, and New York, on the one hand, and points in Central[12] and Western Trunk-Line[13] territories, on the other, over *rail-ocean-rail* routes, via rail to or from North Atlantic ports, ocean to or from Hampton Roads ports, Virginia, or Savannah, Ga., and rail beyond.

(6) Between North Atlantic ports, on the one hand, and points in Utah and Colorado, on the other, over *ocean-rail* or *rail-ocean* routes via ocean to or from Hampton Roads ports, Virginia, South Atlantic, or Gulf ports and rail beyond.

(7) Between points in New England, New Jersey, Delaware, Pennsylvania, and New York, on the one hand, and points in Utah and Colorado, on the other, over *rail-ocean-rail* routes via rail to or from North Atlantic ports, ocean to or from Hampton Roads ports, Virginia, South Atlantic, or Gulf ports and rail beyond.

(8) Between North Atlantic ports, on the one hand, and points in Mountain Pacific and Pacific States, on the other, over *ocean-rail* or *rail-ocean* routes via ocean to or from Hampton Roads ports, Virginia, or Louisiana and Texas Gulf ports and rail beyond.

PACIFIC COASTWISE TRADE

(1) Between California ports, on the one hand, and points in Oregon, Washington, and Idaho on the other, over *ocean-rail* or *rail-ocean* rontes, via ocean to or from North Pacific coast ports and rall beyond.

(2) Between points in California, on the one hand, and North Pacific coast ports, on the other, over *rail-ocean* or *ocean-rail* routes, via rail to or from California ports and ocean beyond.

INTERCOASTAL TRADE

(1) Between points in Arkansas, Illinois, Indiana, Iowa, Minnesota, Kentucky, Mississippi, Missouri, and Tennessee, on the one hand, and Pacific coast ports, on the other, over (1) *barge-ocean* or *ocean-barge*, (2) *rail-barge-ocean* or *ocean-barge-rail*, or (3) *rail-ocean* or *ocean-rail* routes via (1) barge, (2) rail-barge or barge-rail, or (3) all-rail to or from New Orleans, La., or Mobile, Ala., and ocean beyond. There are no joint rates in connection with the intercoastal Atlantic-Pacific lines.

GREAT LAKES TRADE

(1) From Lake Erie ports and Port Huron and Marysville, Michigan, to points in northern California, Idaho, Oregon, and Washington over *lake-rail* routes via lake to the ports of Milwaukee, and Green Bay, Wis., and Duluth, Minn., and rail beyond.

(2) Between points in Eastern territory,[14] on the one hand, and ports on Lake Michigan and Lake Superior, on the other, over *rail-lake* or *lake-rail* routes via rail to or from Lake Erie ports and lake beyond.

(3) Between Lake Erie ports, on the one hand, and points in Western Trunk-Line territory[15] on the other, over *lake-rail* or *rail-lake* routes via lake to or from western Great Lakes ports and rail beyond.

(4) Between points in Eastern territory,[14] on the one hand, and points in Western Trunk-Line territory,[15] on the other, over *rail-lake-rail* routes via rail to or from Lake Erie Ports, lake to or from western Great Lakes ports and rail beyond.

The joint rail-and-water rates of the common-carrier steamship lines in the coastwise, intercoastal, and Great Lakes trades applying on both class-rate traffic and specific commodities, whether prescribed by regulatory bodies or established by voluntary action of the interested carriers, are related to the corresponding all-rail rates. The latter have become what is termed the "ceiling" or maximum for the joint rail-and-water rates. Changes in the rail rates are reflected in the rail-and-water rates, i. e., when fluctuations occur in the former they likewise occur in the latter. A downward trend in rail rates forces parallel reductions in the competing rail-and-water rates. For instance, Southern rail carriers recently made a downward revision of more than 4,000 less-than-carload freight classification ratings and some 225 carload freight classification ratings applicable on merchandise traffic between points in the South and between such points and North Atlantic

[7] The joint rates included in these rate structures are generally lower than the corresponding all-rail rates by amounts or differentials fixed by mutual agreement of the interested carriers or prescribed by the Interstate Commerce Commission upon complaints and after public hearings.

[8] That portion of the United States east of the Mississippi River and south of the Ohio River from Cairo, Ill., to Kenova, W. Va., and the line of the N. & W. Ry., from Kenova, W. Va., eastward through Roanoke, Lynchburg, Petersburg, and Suffolk, Va., to Norfolk, Va., inclusive.

[9] Arkansas, Louisiana (west of Mississippi), Oklahoma, and Texas.

[10] Only in connection with rates to and from Southern Territory.

[11] Includes points in Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia.

[12] That portion of the United States generally east of the Illinois and Mississippi Rivers, north of the Ohio River from Cairo, Ill., to Kenova, W. Va., and west of a line from Kenova, W. Va., to Buffalo, N. Y., through Charleston, W. Va., Parkersburg, W. Va., Pittsburgh, Pa., and Oil City, Pa.

[13] Eastern Colorado, northwestern Illinois, Iowa, Kansas, Michigan (upper peninsula), Minnesota, northern Missouri, Nebraska, South and North Dakota, Wisconsin, and eastern Wyoming.

[14] For explanation, see footnote 11.

[15] For explanation, see footnote 13.

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ports served by the coastwise lines. These general reductions in rail rates necessitated a downward readjustment in the corresponding rates on an important part of the merchandise traffic carried by the steamship lines in the Atlantic and Gulf coastwise trade.

The ocean-and-rail class rate adjustments between Eastern territory and the South and Southwest through the North Atlantic ports, on the one hand, and the South Atlantic and Gulf ports on the other, reflect certain principles adopted by the Interstate Commerce Commission in recent years in the prescription of some of the principal joint ocean-and-rail rate adjustments. Since about 1925 that Commission has prescribed major all-rail rate adjustments, based primarily on distance, for application interterritorially between the various rate territories generally east of the Rocky Mountains. In connection with these rate adjustments, the plan has been to prescribe maximum first-class rates with the rates on the lower classes and certain specified commodities assigned a percentage of the prescribed first-class rate. The Interstate Commerce Commission in connection with these major rate adjustments prescribed maximum all-rail first-class and related class and commodity rates between the Eastern territory and the South [16] and Southwest [17] and also maximum ocean-and-rail first-class and related class and commodity rates between the same territories. These latter were based differentially lower than the prescribed all-rail rates and were predicated to a considerable extent on the principle of distance, although consideration was also given to other factors such as transfer services at the ports, the ratio of rail to water haul, and the competition of the respective ocean-and-rail routes with each other as well as with the all-rail routes between the same points. In connection with the ocean-and-rail rates between Eastern territory and the Southwest, three sets of rates were prescribed, one for application via South Atlantic ports, one for application via Louisiana ports, and one for application via Texas ports. For instance, the prescribed all-rail first-class rate from New York to Amarillo was $3.41 per 100 pounds, the prescribed ocean-rail first-class rates between the same points being $3.30 via the South Atlantic ports, a differential of 11 cents; $3.20 via New Orleans, La., a differential of 21 cents; and $3.10 via Galveston-Houston, a differential of 31 cents. Under this system the greater the water-haul between the ports the greater was the differential, thus giving recognition to the economy of water transportation particularly where the longer water-hauls resulted in a reduction in the length of the rail hauls beyond the ports.

The differentials by which the ocean-and-rail rates are lower than the all-rail rates are of two types, i. e., (1) sliding differentials, which vary with the circuity and length of haul of the ocean-and-rail routes and (2) fixed differentials which apply irrespective of the circuity and length of such hauls. The various differentials are the result of the voluntary action of the interested carriers through mutual consent, or of the prescription of ocean-and-rail rates by the Interstate Commerce Commission in general rate adjustments. The differentials on the commodities classified fourth-class or higher usually afford shippers greater savings than do the lesser differentials on the commodities rated lower than fourth-class. The differentials in connection with specific commodity rates vary with the nature of the commodity.

The water-and-rail rates of the common carriers in the coastwise, intercoastal, and Great Lakes trades are usually governed by the same economic principles as govern the all-rail rates and are generally subject to the same classifications, rules, regulations, and practices as are followed by the rail lines. From what has been said, it is evident that the ocean-and-rail and lake-and-rail rate structures provide shippers with a variety of rates and routes to and from a large area of the United States. They apply on practically every commodity of importance. The joint rates of the common-carriers in the coastwise, intercoastal, and Great Lakes trades with rail and motor carriers have been subject to the jurisdiction of the Interstate Commerce Commission since 1887 in the case of the water-and-rail rates, and since 1935, in the case of the motor-and-water rates.

The Regulation of Rates

Any attempt to establish a national transportation policy designed to bring about a national transportation system of maximum efficiency, must result in quick understanding that the three media (rail, road, and water) which move an enormous preponderance of goods, wares, and merchandise between the several States must be dealt with as essential parts of an integrated whole, and that the most effective public action in so dealing with them may be exercised through the use of the certificate of public convenience and necessity, and through the regulation of rates.

Until recently, rate regulation reasonably calculated to further such an integrated and efficient national transportation system was difficult. Interstate rail rates were regulated by the Interstate Commerce Commission, water rates by the Maritime Commission, and road rates, i. e., motor transport, by no one at all.

[16] Docket 13,494, *Southern Class Rate Investigation*, 100 I. C. C. 513 et seq.

[17] Docket 13,535, *Consolidated Southwestern Cases*, 123 I. C. C. 203; 211 I. C. C. 601; and 222 I. C. C. 229.

The most complete cooperation (and there has been such cooperation) between the Maritime Commission and the Interstate Commerce Commission could not prevent situations where water and rail rates collided to the detriment of the public; the motor carriers were at the same time free to utilize their unregulated rates in a manner calculated to produce transportation chaos.

Since March 1, 1941, however, the Interstate Commerce Commission has been charged with the duty of regulating interstate water carriers as well as rail and motor carriers. Its jurisdiction over these water carriers is limited by certain provisions of Part III of the Interstate Commerce Act which, under specified conditions, exempt from regulation the transportation of bulk commodities and transportation within the limits of a single harbor or contiguous harbors. That Commission is now empowered to deal with interstate rail, road, and water carriers as parts of a national transportation system, and to regulate the rates of each in such manner that the shipping public will be dealt with fairly, and that "cut-throat competition" will be prevented. Such rate regulation, and the rate structures built up thereby (especially when combined with the power to grant or deny certificates of public convenience and necessity, and general regulatory powers) may be expected to foster the healthy growth of each of the three types of carriers as parts of the whole, rather than the growth of one type of carrier at the expense of another which flows from regulatory treatment of each type separately instead of as units of a single enterprise. Such integrated regulation should provide rate structures which will foster the effective use of the various types of carrier-facilities, and improve the geographic pattern of our national economic development.

The Interstate Commerce Commission will probably realize the clear necessity that if water carriers are to prosper to the extent necessary for their proper development—and, in fact, necessary for their survival as essential parts of a national transportation system—the water carriers must be permitted to charge substantially lower rates than rail and motor carriers. How much lower, of course, is a matter for the decision of that Commission. The reasons making such lower rates necessary are clear. Water routes are generally indirect, and the distance traveled between the points where cargo originates and the points where it is delivered is, in almost every instance, far greater than the distance which would be traveled if the cargo went by rail or motor-truck. Lower rates must compensate for slower delivery if the water carrier is to be upon a competitive basis with the carrier by rail or road. In fact, as to much freight and cargo where speed of delivery is essential, the water carrier cannot compete. This fact increases the necessity for placing the water carrier upon a genuine competitive basis with rail and motor transport as to other freight or cargo. Furthermore, it is generally recognized that there are certain hazards to carriage by water, which place the water carrier at a disadvantage, requiring a rate differential in its favor. The necessity of frequent breaking of bulk at ports where cargo is transferred from water to land, and consequent increased handling are deterrent factors to shipping by water, and result in more numerous claims for loss or damage. These and other factors clearly must be recognized.

Obviously, too, the fourth section of part I of the Interstate Commerce Act requires unusually careful administration where water carriers are affected, if those carriers are not to suffer serious injury. "Relief" from the fourth section (and particularly so-called "temporary" and "seasonal" relief) has in the past been utilized by railroads competing with steamship lines to divert the business of the competing water carriers. This, of course, has resulted in retaliation by water carriers, and serious dislocations in rate structures and routing of traffic. Recognition of the factors discussed above, however, and administration of the fourth section in a manner sympathetic to all affected carriers will bring to water carriers the right to operate on a genuinely competitive basis with carriers by rail and motortrucks. Such administration will promote the building up of an integrated system of transportation capable of maximum economy and efficiency in operation.

Coordination of Facilities of Water Carriers With Those of Other Modes of Transportation

Necessity for Coordination

The term "coordination" has been aptly defined as cooperative action in a common interest at particular places or with respect to particular matters, but without actual unification of companies.[18] Such cooperative action may be between carriers of the same type or between carriers of different types.

Our coastwise, intercoastal, and Great Lakes transportation is provided by many large and small companies which are independently owned. Each is primarily concerned with its own individual interests and most of them are more or less in competition with each other. Practically all of these water carriers are also in active competition with rail and motor-truck lines. It is generally recognized that this competitive system has provided a considerable amount of duplicated service, hindered the use of equipment to capacity,

[18] *Fifty-second Annual Report of the Interstate Commerce Commission*, November 1, 1938, p. 14

caused reductions of rates to levels whose compensatory nature is often very doubtful, resulted in uneconomical cross-hauling of shipments, and produced other forms of waste which have not been particularly conducive to the maintenance of a well-organized and financially sound national transportation system. These conditions have been largely due to the depression, the desire of shippers for cheaper transportation, and the carriers' need of revenues. While shippers, no doubt, have benefitted from the resulting choice of service and numerous rate reductions, the carriers themselves suffered from lack of effective cooperation in readjusting their practices and properties to meet changing economic conditions; instead they were engaging in an oftentimes ruthless competitive struggle which tended to undermine not only the rate structures but the financial soundness of many of the carriers themselves. There has always been a certain amount of voluntary cooperation among the various carriers but there is much room for a more permanent, broader, and systematic type of coordination which will meet changing conditions and yet protect the interests of the public and of the carriers themselves.

Types of Present-day Coordination

The coastwise, intercoastal, and Great Lakes carriers have made substantial efforts toward coordination of their facilities with other types of carriers and between themselves. There are no finer examples of coordination than that which exists between the rail carriers and the Great Lakes carriers for the carriage of such bulk commodities as iron ore and coal and between the rail carriers such as the Chesapeake & Ohio Ry., the Virginian Ry. and the Norfolk & Western Ry., on the one hand, and the coastwise bulk carriers, on the other, for the transportation of West Virginia coal to New England. This coordination has resulted in these rail lines acquiring traffic which otherwise would not flow to them. The system of coordination with rail in connection with the Great Lakes bulk freighters has been succinctly described as follows:[19]

> There you have in these four basic commodities the keystone of the great industries of the United States upon which the subsidiary steel-finishing industries depend. This transportation has been so built up as to be adapted to that particular service. It has interchanges; it has interrelation. It is controlled by nature and economic law. No shipper complains of it; no railroad complains of it. The railroads are the beneficiaries of it. They bring the traffic to us; they take it away from us. They have created great facilities to enable them to do that with the utmost rapidity. They have built great yards to receive our product or to store it until we are ready for it. They have helped us to build up this great thing and it is not in competition with them in any particular.

The common-carrier lines, as well as the contract-carrier lines in the coastwise, intercoastal, and Great Lakes trade, have made efforts towards coordination of facilities. The use of motor-trucks for the performance of so-called pick-up and delivery service is an instance. There are others. Several of the steamship lines operating in the common-carrier service on the Great Lakes have established joint lake-and-truck rates on automobiles between Detroit and points in Maryland, Ohio, Pennsylvania, West Virginia, and the District of Columbia via lake lines to or from Cleveland and truck routes beyond. The establishment and maintenance of joint rates between rail and domestic ocean lines is representative of cooperation between these two classes of carriers.

The railroads and common-carrier motor truck lines are often reluctant to establish joint rates and through routes with common-carrier water lines when the first two mentioned classes of carriers are in a position to perform the long haul from origin to destination over their own routes. This competitive situation often precludes the fullest coordination of facilities of the three types of carriers. On the other hand, the so-called bulk or contract-water carriers often have such low transportation costs that the rail or truck carriers could not hope to participate in hauling certain traffic without the intervention of the bulk-commodity water carriage. In such cases, the all-rail or all-truck routes are unable to compete with either the water routes or the combined routes of the rail or motor truck carriers and the bulk-commodity water carriers because of the inherent economy of the water transportation. Consequently, the coordination of water-carrier facilities and services with those of rail and motor truck lines is often more easily attained in connection with bulk or contract water carriers than with common-carrier water lines.

The common-carrier water lines in both the domestic ocean and Great Lakes trades have joined with the railroads and motortruck lines in so-called freight rate associations which issue joint tariffs containing the joint rates between these several classes of carriers. This arrangement enables the carriers involved to establish joint rates through mutual agreement and concerted action and have them published at a minimum of expense and clerical labor. It also gives the shipper a ready means of quickly ascertaining a choice of routes, and supplies another avenue through which the carriers can effect the cooperative use of their available transportation facilities.

The domestic water lines have also attempted to effect coordination between themselves so as to obtain

[19] Statement of general counsel of Lake Carriers Association, p. 1067 of *Joint Hearings Before Committee on Interstate Commerce and Merchant Marine Subcommittee of the Committee on Commerce, U. S. Senate, Water Carrier Act, 1935* (*S. 1632*) March 11–19, 1935.

more equitable use of their facilities, through voluntary associations known as conference agreements, the general purposes of which include the fixing, self-regulation, and stabilization of ocean freight rates and rate practices. These agreements have been subject to a certain amount of Federal regulation, but they have not been completely effective. This is illustrated by the case of the intercoastal steamship lines operating between the Atlantic and Pacific ports. The United States Intercoastal Conference of the Atlantic-Pacific lines was first organized on August 5, 1920. Although it was never able to embrace all of the lines in the trade, its members maintained uniform rates on westbound traffic. It continued to function until June 1922. A severe rate war followed until the conference was again organized on August 1, 1923, and lasted until July 31, 1927. During this period the member carriers were classified into "A" and "B" lines according to the frequency of their vessel operations. After the conference was reorganized on August 1, 1927, all its members applied uniform rates, except on certain commodities, until the end of the conference on February 13, 1931, whereupon another rate war occurred.

A reorganized conference came into being on March 1, 1932, and lasted until September 30 of that year. During this period, the conference, for the first time, recognized one carrier as a "C" line, entitled to charge lower rates than the "B" lines. The admission of the "C" line to the conference, on the lower rate basis, was designed to prevent it from naming rates much lower than it was willing to name as a conference member. The breaking up of the March 1, 1932, conference, after its 7 months' existence, was due largely to the fact that 3 weeks after it was organized, practically all "B" lines reduced their frequency of service and became "C" lines under the terms of the agreement. The United States Intercoastal Conference was again organized on October 1, 1932, consisting of only "A" and "B" lines, the latter having the less-frequent service. Several nonconference lines maintaining rates lower than those of the conference lines were a source of agitation which was obviated or lessened by compromises. The conference again disbanded on July 31, 1934.

At the present time (October 1941) all but one of the intercoastal common carriers engaged in regular operation between Atlantic and Pacific ports, are members of the Intercoastal Steamship Freight Association, a freight rate association organized July 17, 1936, for the purpose of cooperation and the maintenance of uniform rates. Four lines which have the more frequent and better class of service are known as "A" lines and the others as "B" lines. The "A" and "B" line rates are the same except that on a limited number of westbound commodities the "B" line rates are 2.5 cents lower than those of the "A" lines.

On the Great Lakes it is common practice for common carriers by water receiving automobiles for transportation to have the actual carriage performed on vessels of other lines which they neither own nor control. The common carrier which receives the automobiles, issues the bills of lading and engages with the shipper for the transportation, retains control of and assumes liability for them while on the vessels of other carriers. In other words, the carriers pool their resources so as to provide more frequent schedules and conserve space where capacity loads of automobiles are not available on the regularly scheduled sailing dates. These cooperative arrangements between carriers are made by agreement. The following statement with respect to these agreements is of interest: [20]

> The importance of the agreements in effecting economies is emphasized. It is testified that there are times when as many as 400 or 500 automobiles per day are tendered to Minnesota-Atlantic for transportation and other times when the number received may be less than 30 or 40. Thus, it is pointed out, if it operated vessels sufficient to give prompt service to shippers during the peaks of movement, it would have a large amount of surplus vessel space on hand when the movement was slack. On the other hand, with no additional space to supplement its minimum requirements, it would be unable to meet the demands of shippers when traffic was at its peak without delay to the shipments tendered. The agreements provided a means of taking care of cargo overflow without operating more vessels * * *

Methods of Effecting Broader Coordination

The coordination which exists today has been effected largely through the voluntary action of the interested carriers. This involves certain weaknesses, including: (1) lack of effective restrictions against independent action by carriers dictated by their own individual interests without regard to the broader interest; (2) the tendency for competition, when it becomes intensified, to take precedence over efforts to bring about cooperative carrier-shipper action; and (3) the practice of many transportation executives of continuing to adhere to traditional and out-moded methods. It is evident that the broader type of coordination cannot be brought into being by voluntary action but must be stimulated by the powers of government.

The enactment of the Transportation Act of 1940 brought the domestic water carriers engaged in interstate transportation under the jurisdiction of the Interstate Commerce Commission except to the extent that the exemptions in the Act restrict the Commission's jurisdiction. As a result of this act, and its amendment of the Interstate Commerce Act, all carriers by rail and pipe line, and the great majority of

[20] Docket No. 511, *New Automobiles in Interstate Commerce*, 2 U. S. M. C. 360, 363 (September 4, 1940).

highway and water carriers which operate interstate between points in the United States are now regulated by that one Commission.

The new transportation act provides for the coordination of transportation facilities of the various types of carriers in a number of ways. In the first place, the Commission is required, in connection with its power to prescribe just and reasonable rates via all carriers under its jurisdiction, to give due consideration, among other factors, to the need, in the public interest, of adequate and efficient transportation service via each type of carrier at the lowest cost consistent with the furnishing of such service. The accomplishment of this objective will prevent one kind of carrier from transporting traffic which should more appropriately be handled by another kind, and thus enable each to know better the traffic it can count on and for which it can better plan the supply of its facilities. It should also tend to alleviate the uncertainty caused by the shifts of traffic from one type of carrier to another through competitive rate reductions which result oftentimes in noncompensatory rates.

The Interstate Commerce Commission now has power to prescribe minimum rates for all carriers under its jurisdiction. This power can be used to prevent rate-cutting which has had a serious effect on the rate structures of all carriers, and will tend to prevent the rail and motor carriers from unfairly diverting traffic from the contract and common-carrier water lines and thus impairing the preservation of such common-carrier and contract-carrier water transportation facilities as are needed in the public interest.

Control over routes, extension of routes, and operation of carriers is particularly essential to a program of coordination. Such control is vested in the Interstate Commerce Commission through the requirement of the Interstate Commerce Act, as amended by the Transportation Act of 1940, that common and contract carriers subject to the jurisdiction of that Commission must apply to it for, and receive, a certificate or permit respectively, to do business. Thus the supply of facilities can be regulated by permitting only those carriers to enter the business whose operations are justified in the public interest. Those who engage in contract carriage will be prevented from trespassing unfairly on the business of the common carriers whose service obligations they are not always willing to assume. An excessive number of duplicate routes, particularly with respect to the water carriers, can be prevented by the certificate and permit provisions.

The new transportation act also provides that the Interstate Commerce Commission can establish through routes and joint rates between water carriers and rail lines. Thus the water carriers may be enabled to participate in through routes which might otherwise be denied them by the railroads. By the appropriate extension of through rail-and-water routes and joint rates greater coordination of rail and water facilities is brought about and greater use made of each.

The amendment of the Interstate Commerce Act by the Transportation Act of 1940 now makes possible government regulatory control over the accounts, records, and reports of all carriers by rail, water, motor, and pipe line which are subject to these Acts. Such control is essential to coordination; it permits the setting up of uniform systems of accounts and furnishes the data needed by the regulatory body to determine the status of a carrier's business. The power of the Interstate Commerce Commission to regulate consolidations, mergers, acquisitions of control, leases, etc., of carrier properties has been broadened by the Transportation Act of 1940 to apply to domestic ocean, Great Lakes, and inland waterway carriers.

Section 1 of the Transportation Act of 1940 declares that the national transportation policy of Congress shall be to provide for fair and impartial regulation of all modes of transportation subject to the provisions of the Act, so administered as to recognize and preserve the inherent advantages of each; to promote safe, adequate, economical, and efficient service and foster sound economic conditions in transportation among the carriers; to encourage the establishment and maintenance of reasonable charges for transportation services, without unjust discriminations, undue preferences or advantages, or unfair or destructive competitive practices; to cooperate with the various States; to encourage fair wages and equitable working conditions; "all to the end of developing coordination and preserving a national transportation system by water, highway, and rail, as well as other means," adequate to meet the needs of commerce, the Postal Service, and the national defense.

It is evident that the new transportation legislation emphasizes the need for broad coordination of transportation facilities, makes such coordinating action mandatory and provides the tools with which it may be accomplished. The Transportation Act of 1940 provides a basis for coordination which maintains a due regard for the advantages and necessities, and the proper functions of the water carriers as well as of all other parts of the national transportation system.

The Role of Public Action in Transport Regulation and Promotion

Protection of Coastwise, Intercoastal and Great Lakes Trades

The policy of restriction of the coastwise trade to United States vessels was adopted by statute as early as March 1, 1817. Since that time Congress has re-

served, with few exceptions,[21] our coastwise, intercoastal, and Great Lakes trades to vessels documented under the laws of the United States and built in United States shipyards. This protection was extended not only from time to time as new seacoast was acquired, but to noncontiguous territories as well. In 1868 Congress extended our navigation and "coasting trade" laws to the Territory of Alaska, and in 1898 and 1899 extended the application of our coastwise laws to Puerto Rico and Hawaii and restricted United States trade with those islands to United States ships.[22]

Section 27 of the Merchant Marine Act, 1920, as amended, provides that no merchandise shall be transported by water, or by land and water, on penalty of forfeiture thereof, between points in the United States, including Districts, Territories, and possessions thereof embraced within the coastwise laws, either directly, or via a foreign port, or for any part of the transportation, in any other vessel than a vessel built in and documented under the laws of the United States and owned by persons who are citizens of the United States, or vessels to which the privilege of engaging in the coastwise trade has been lawfully extended. This protective policy followed in connection with the coastwise trade[23] has prevented the inroads of foreign competition and enabled United States shipping operators to control the development of the coastwise, intercoastal, and Great Lakes routes to the point where they are today major factors in our national transportation system.

Public Regulation and Control of Domestic Ocean and Great Lakes Shipping

Scope of public regulation.—Water carriers in the deep-sea domestic trades have been subjected to some measure of federal control from the beginning, this being one of the important reasons for the adoption of our Constitution. The earlier laws pertained mostly to navigation and safety of operation. For many years prior to 1903 they were administered by the Treasury Department through its Bureau of Navigation and Steamboat Inspection Service. In that year these administrative units were transferred to the Department of Commerce and Labor and in 1913 they were retained by the Department of Commerce.[24]

Prior to the enactment of the Shipping Act, 1916, there was no federal regulation over the services, accounts, records, practices, or port-to-port rates of the coastwise and intercoastal water carriers, except that exercised by the Interstate Commerce Commission over the port-to-port rates and practices of certain railroad-owned coastwise lines under the provisions of the Panama Canal Act of 1912, which required those lines to be regulated in the same manner and to the same extent as the railroad or railroads owning or controlling them. Regulation under the Shipping Act, 1916, which applied only to common carriers, including those on the Great Lakes, was limited, particularly with respect to rates and rate practices, and was not definite enough to permit the Shipping Board to bring about effective rate control.

The Intercoastal Shipping Act, 1933, an outgrowth of the chaotic rate conditions in the intercoastal trade in 1931, conferred more specific authority upon the Board with respect to intercoastal carriers. This Act applied to both common and contract carriers and gave the Board, and its successor, the Maritime Commission,[25] jurisdiction over the rates, fares, and charges of such carriers, with the power of suspension. The Shipping Act, 1916, as well as the Intercoastal Shipping Act, 1933, continued to apply to intercoastal carriers.

In 1938, the Intercoastal Shipping Act, 1933, was amended to give the Maritime Commission authority to prescribe lawful minimum, as well as maximum rates, fares, and charges, in lieu of those found unlawful. The provisions of this amended Act were extended to apply to common carriers (i. e. those operating on regular routes from port to port) in the Great Lakes and coastwise trades, which carriers had previously been regulated by the Maritime Commission, except that the minimum rate clause was not made applicable to such common carriers on the Great Lakes. The powers given to the Maritime Commission did not include regulation of contract carriers in the Great Lakes and coastwide trades. Regulation of coastwide, intercoastal, and Great Lakes carriers by the Maritime Commission, until the advent of the Transportation Act of 1940, was based on the Shipping Act, 1916, as amended, and the Intercoastal Shipping Act, 1933, as amended.

Since its enactment in 1887, the Interstate Commerce Act has applied to the transportation of passengers or property partly by railroad and partly by water when both are used under a common control,

[21] The acts of August 18, 1914, and October 6, 1917, and section 22 of the Merchant Marine Act, 1920.

[22] *Economic Survey of Coastwise and Intercoastal Shipping,* U. S. Maritime Commission, 1939, p. 3.

[23] Under existing statutes the term "coastwise trade" denotes transportation by water between United States ports along the Atlantic, Gulf, and Pacific coasts, between United States Pacific and Atlantic ports via the Panama Canal, or between these various United States ports, on the one hand, and ports in the noncontiguous United States possessions of Hawaii, Alaska, and Puerto Rico, etc., on the other.

[24] *Regulation of Transportation Agencies,* Federal Coordinator of Transportation, 1934, p. 162.

[25] The Merchant Marine Act, 1936, approved June 29, 1936, created the United States Maritime Commission and gave it the powers that had been vested in the Shipping Board and transferred to the Shipping Board Bureau of the Department of Commerce in 1933.

management, or arrangement for a continuous carriage or shipment. The Motor Carrier Act, 1935, which is known as part II of the Interstate Commerce Act, gave the Interstate Commerce Commission jurisdiction over common-carrier water lines only to the extent that these lines might voluntarily enter into arrangements with common-carrier motor truck lines for through routes and joint rates. Under the Panama Canal Act, 1912, which is now incorporated in the Interstate Commerce Act, the Interstate Commerce Commission has the same jurisdiction over railroad owned or controlled water lines as it has over the railroads owning or controlling them. Thus, it will be observed that that Commission has had an important measure of regulatory power, for a long period, in connection with common-carrier water lines. Under this regulation the Interstate Commerce Commission has had no power to prescribe minimum rates in connection with joint rail-and-water routes but has had such power since 1935 in connection with joint water-and-truck rates.

The Transportation Act, 1940, gives the Interstate Commerce Commission jurisdiction over domestic common and contract water carriers similar in many respects to that now applied to rail and highway carriers. The regulatory authority of the Maritime Commission over domestic water carriers has been transferred, under the provisions of this Act, to the Interstate Commerce Commission, except in connection with ocean transportation between ports in continental United States, on the one hand, and such noncontiguous United States territories as Hawaii, Alaska, and Puerto Rico, on the other. Consolidations, mergers, acquisitions, accounts, records, reports, rates, charges, and other practices of the water carriers are subject to regulation. Certificates of public convenience and necessity for common carriers and permits for contract carriers are required for such carriers to do business, a procedure which was not contained in the Acts administered by the Maritime Commission. The 1940 Act provides for certain exemptions from regulation for water carriers, under certain specified conditions, such as, for instance: (1) transportation (except transportation subject previously to the amended Intercoastal Shipping Act) by a water carrier of commodities in bulk when the cargo space of the vessel in which such commodities are transported is being used for the carrying of not more than three such commodities; (2) transportation by contract carrier which by reason of the inherent nature of the commodities transported, their requirement of special equipment, or their shipment in bulk is not in actual or substantial competition with any common carrier by water, rail, or motor, such exemption to be obtained by application to the Interstate Commerce Commission; (3) transportation in interstate commerce within the limits of a single harbor or between places in contiguous harbors, when such transportation is not a part of a continuous through movement under a common control, management, or arrangement to or from a place without the limits of any such harbor or harbors; and (4) transportation of liquid cargoes in tank vessels designed for use exclusively in such service and certified under regulations approved by the Secretary of Commerce.

Control of facilities used in domestic ocean and Great Lakes trades.—Shipping facilities embrace not only the vessels but, indirectly, also such other facilities as port terminals, shipyards, harbors and coastlines, and maritime labor supply. An appreciable measure of control of these facilities is exercised through regulation by federal statutes administered by the Maritime Commission, the Interstate Commerce Commission,[26] the Bureau of Marine Inspection and Navigation of the Department of Commerce, the Maritime Labor Board, the Coast and Geodetic Survey, the Corps of Engineers, and several other government departments.

The facilities which the port terminals offer are just as essential a part of water transportation as are the vessels. The control of such facilities constitutes an important problem on account of the varying methods under which they are operated and the complexity of charges assessed by them as a result of the many different kinds of services performed. The ports of the United States comprehend a great variety of types of facilities depending upon the classes and volume of traffic handled. They are owned and operated in a number of ways. In some of them the facilities such as wharves, piers, docks, and warehouses are owned by private industrial concerns, railroads, or steamship companies. At other ports all or practically all of the facilities are owned and controlled by the municipalities and leased to users. In some instances the port facilities are owned partly by public authorities and partly by private concerns. Still another method of port administration is found at ports where the facilities are owned, managed, and regulated by state governments, such as at New Orleans where an important part of the port facilities was built and is operated by the Board of Commissioners of the Port of New Orleans, an agency of the State of Louisiana.

There are also in the United States several instances at which the port facilities are owned and administered by a public corporation usually embracing an area greater than the limits of the port city proper. The Port of New York Authority is a public corporation which serves not only the port city proper, but also the adjacent area including that in another State, New Jersey, in the development of the port. It is an agency

[26] For instance, under the provisions of the new Transportation Act of 1940 requiring common-carrier certificates and contract-carrier permits.

created by compact between the States of New York and New Jersey to carry out the port development functions of those States. Its work falls into four principal categories, namely: port development and improvement; protection of port commerce; construction of authorized facilities; and operation of the latter.

Port services and charges generally applicable to coastwise and intercoastal traffic may be divided into two groups, namely, (1) those against the cargo and (2) those against the vessels. In the first category may be included: labor; handling equipment; surveyors' fees and services; ship dunnage; custom house fees; freight brokers' service and fees; wharfage; top-wharfage; special handling and unloading charges; storage; grain elevators; cartage and drayage; lighterage; switching and weighing. The second category includes: pilotage; towage; running lines; dockage; moorage; sheddage; harbor dues; watchman service; water supply; bunker coal; fuel oil supply; ballast; agency service and fees; electric power supply and charges; launch hire; side-wharfage; stevedoring; ship dunnage; and Federal vessel document fees.

S. 1632 (Water Carrier Act, 1935), which never became law, contemplated regulation of wharfingers by the Interstate Commerce Commission. During the Senate hearings on it, March 11 to 19, 1935, the Federal Coordinator of Transportation, Joseph B. Eastman, in connection with an inquiry as to the necessity for the proposed public regulation, said:[27]

> The same situation exists with respect to wharfage and handling charges. There is most intense competition. *There is an oversupply of those facilities, and you cannot control it through the railroads alone, because they are subject to the competition of these other agencies. Our general observation is that there is a feeling on the part of the operators generally, whether they are State or municipal, or private, or railroad, that you cannot clear up that situation satisfactorily without public regulation, and that public regulation would have to be done by the Federal Government.*
>
> In my judgment, and based upon the complaints which we frequently receive from both State and municipally owned docks, I think that would work out to their advantage. We have had many complaints that a State builds a dock or a municipality builds a dock, but *it is utterly unable to secure any proper revenue from it*, and the burden falls upon the taxpayers, because the railroads will not charge for certain services, and they say, "we cannot charge unless the railroads do." When we talk to the railroads they say "we would be glad to charge for these things if everybody else would agree to it."
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> * * * * *
>
> I think that at the present time a situation exists, *due to an over-supply of these facilities and to the intense competition among the operators, which results in the services being given away, or provided at inadequate prices.* * * * [Italics supplied.]

[27] *Joint Hearings before the Committee on Interstate Commerce and the Merchant Marine Subcommittee on Commerce*, U. S. Senate, 74th Congress, 1st Session on S. 1629 and S. 1632, March 11–19, 1935, pp. 656, 657, 658.

The Interstate Commerce Commission and the United States Maritime Commission have had jurisdiction over the operation, rates, charges, and practices of port facilities owned and controlled by the carriers which are under their respective regulation by virtue of the Interstate Commerce Act as amended: the Shipping Act, 1916, as amended; the Merchant Marine Act, 1920, as amended; the Intercoastal Shipping Act, 1933, as amended; and the Merchant Marine Act, 1936, as amended. The Maritime Commission also has possessed some authority over independent operators of port facilities which are used by the common carrier water lines. Under section 15 of the Shipping Act, 1916, all agreements between common carrier water lines under the Maritime Commission's jurisdiction and independent port facility operators are required to be filed with the Commission, which may disapprove, cancel, or modify any of them found to be unjustly discriminatory or unfair. Section 16 makes it unlawful for port facility operators to unduly prefer or unduly prejudice any particular person, locality, or description of traffic in any respect whatsoever. Section 17 provides that port facility operators furnishing facilities to common carrier water lines shall establish, observe, and enforce just and reasonable regulations and practices relating to or connected with the receiving, handling, storing, or delivering of property and that the Maritime Commission may determine, prescribe, and order enforced a just and reasonable regulation or practice in lieu of any found to be unjust or unreasonable. Section 21 of the Shipping Act, 1916, provides that the Maritime Commission may require port facility operators to file with it any periodical or special report, or any account, record, rate, or charge or any memorandum of any facts and transactions pertaining to their business. There are no provisions in the acts which have been administered by the Maritime Commission requiring independent facility operators to file tariffs with it. On the whole, the Maritime Commission's authority over the practices of independent port facility operators has been largely permissive rather than mandatory. There have been some seven or eight instances in which formal cases have arisen, under this authority, concerning the charges and practices of independent port facility operators.[28]

[28] See No. 173—*Terminal Charges at Norfolk, Va.*, Agreement No. 3488, 1 U. S. S. B. 357 of February 23, 1935; No. 221—*Storage of Import Property*, 1 U. S. M. C. 676 of Nov. 16, 1937; No. 446—*Port of Philadelphia Ocean Traffic Bureau* vs. *Philadelphia Piers, Inc., et al.*, 1 U. S. M. C. 701 of Jan. 19, 1938; No. 437—*Buxton Lines, Inc.* vs. *Norfolk Tidewater Terminals, Inc., et al.*, 1 U. S. M. C. 705 of Jan. 19, 1938; No. 482—*In the Matter of Storage Charges under Agreements 6205 and 6215*, 2 U. S. M. C. 48 of March 23, 1939; No. 418—*In the Matter of Services, Charges and Practices of Carriers Engaged in the East-Bound Transportation of Lumber and Related Articles by Way of the Panama Canal*, 2 U. S. M. C. 143 of July 28, 1939; No. 484—*In the Matter of*

Under section 8 of the Merchant Marine Act, 1920, as amended, the Maritime Commission has been required to cooperate with the Secretary of War, with the object of promoting, encouraging, and developing ports and transportation facilities in connection with water commerce over which it has had jurisdiction; to investigate territorial regions and zones tributary to such ports, taking into consideration the economies of transportation by rail, water, and highway and the natural direction of the flow of commerce; to investigate the causes of the congestion of commerce at ports and the remedies applicable thereto; to investigate the subject of water terminals, including the necessary docks, warehouses, apparatus, equipment, and appliances in connection therewith, with a view to devising and suggesting the types most appropriate for different locations and for the most expeditious and economical transfer or interchange of passengers or property between carriers by water and carriers by rail; to advise with communities regarding the appropriate location and plan of construction of wharves, piers, and terminals; to investigate the practicability and advantages of harbor, river, and port improvements in connection with foreign and coastwise trade; and to investigate any other matter that may tend to promote and encourage the use by vessels of ports adequate to care for the freight that would naturally pass through such ports; provided that if after such investigation the Maritime Commission found the rates, charges, and practices of common carriers by rail, subject to the Interstate Commerce Act, to be detrimental to the declared object of the section, or that new rates, charges, or practices, new and additional port terminal facilities or affirmative action on the part of such common carriers by rail was necessitated to promote the objects of this section, the Maritime Commission could submit its findings to the Interstate Commerce Commission for such lawful action as needed.

Under the Transportation Act of 1940 jurisdiction over the charges and practices of railroad-owned or controlled port facilities and the port-to-port traffic of intercoastal and coastwise carriers has been transferred to the Interstate Commerce Commission.

Public Aid to Shipping by the Maritime Commission

The Maritime Commission is authorized by the Merchant Marine Act, 1936, as amended, to extend aid in several particulars to operators of vessels in our domestic ocean and Great Lakes trades. Under section 509 of the Act any citizen of the United States may make application to the Maritime Commission for aid in the construction of a new vessel to be operated in the domestic trade (excepting vessels engaged solely in the transportation of property on inland rivers and canals). Upon approval of such application the Maritime Commission pays the cost of any national-defense features of such vessel. In the event the vessel to be built is not less than 3,500 gross tons and capable of a sustained speed of not less than 14 knots, the applicant is required to pay to the Commission not less than 12½ percent of the vessel's cost, and in the case of smaller vessels the payment to the Commission must not be less than 25 percent of the vessel's cost, the cost of the national defense features to be excluded in both instances. The balance of the purchase price is to be loaned by the Commission and paid back to it by the applicant in 20 annual installments at 3½ percent interest, secured by a preferred mortgage on the vessel sold and otherwise secured as the Commission may determine. This form of aid is subject to certain exceptions.

The *Economic Survey of Coastwise and Intercoastal Shipping* published in 1939 by the Maritime Commission revealed that a problem common to all operators in the domestic ocean trades was the replacement of old or obsolete tonnage purchased, for the most part, at bargain prices which attended the disposal of the Shipping Board's war-time fleet, with new vessels at present-day market prices. The Commission recommended to Congress that there be included in the Merchant Marine Act so-called "turn-in-and-build" provisions to alleviate the situation referred to Accordingly, Congress on August 4, 1939, added section 510 to the Merchant Marine Act, 1936, which, in order to facilitate the acquisition of new economical vessels by the domestic operators, permits an operator, subject to certain specified conditions, to turn in to the Commission obsolete vessels over 17 years of age and to receive, as credit for construction or purchase of a new vessel constructed in shipyards of and documented under the laws of the United States, an amount determined by the Commission to represent a fair and reasonable value for the obsolete vessel. The term "obsolete vessel" as used in section 510 is defined to mean a vessel of not less than 1,350 gross tons, which is not less than 17 years old and is, in the judgment of the Commission, obsolete or inadequate for successful operation in the United States domestic trade, and which is owned by United States citizens or has been owned by such citizens for at least 3 years prior to the date of acqusition by the Commission.

Title XI of the Merchant Marine Act, 1936, added on June 23, 1938, authorizes the Maritime Commission to insure mortgages out of a fund provided for the purpose. These mortgages have for their object the

Agreements 6210 A, 6210–B, 6210–C, and 6107, 2 U. S. M. C. 166 of August 3, 1939; and No. 481—2 *In the Matter of Wharfage Charges and Practices at Boston, Mass.*, 2 U. S. M. C. 245 of Jan. 4, 1940

securing of new loans or advances made to vessel operators to aid in the construction, reconstruction, or reconditioning of vessels owned by citizens of the United States which are designed principally for commercial use in the coastwise or intercoastal trade; on the Great Lakes, or on bays, sounds, rivers, harbors, or inland lakes of the United States; or in certain defined foreign trade areas; or in the fishing trade or industry. Among other conditions, a mortgage, to be eligible for insurance, shall not exceed 75 percent of the cost (as estimated by the Commission) of construction, reconstruction, or reconditioning financed by the loan or advance, and shall not exceed 75 percent of the amount which the Commission estimates will be the value of the property after construction, reconstruction, or reconditioning is completed.

Up to the present time several of the operators and carriers in the coastwise, intercoastal, and Great Lakes trades have received aid from the Maritime Commission under the procedures enumerated in section 509 and title XI of the Merchant Marine Act, 1936, as amended. No domestic ocean or Great Lakes operator or carrier has taken advantage of the so-called trade-in provisions of section 510. The aid so far given by the Commission has applied to river towboats, barges, and ocean-going cargo vessels and tankers.

Necessity for Preservation of Domestic Shipping

Coastwise, intercoastal, and Great Lakes shipping occupies an important place in the national transportation system as well as a vital place in the defense system of the Nation. This importance cannot be measured solely in terms of traffic statistics, or even in fleets of vessels. The twin functions of shipping—service to commerce and defense—are in some respects contradictory both with respect to each other and with respect to the agencies they serve. Successful commercial operation calls for economy and reliability; military considerations may dictate uneconomic speeds, extra bulkheads, and other features which tend to reduce earning capacity. There is, however, a definite national responsibility for providing and maintaining adequate services to safeguard these twin functions.

The merchant marine is an essential adjunct of naval operations. The United States, with 60 primary harbors and 7,000 miles of coastline is vitally dependent upon the Navy for defense. This calls for an adequate number of commercial vessels of the proper type and of sufficient speed suitable for quick conversion to military and naval demands. Strong coastwise and intercoastal fleets constitute a valuable reservoir from which to draw such tonnage.

Aside from military and naval considerations, an adequate intercoastal and Great Lakes fleet offers definite and essential contributions to the economy of the Nation. These contributions may be enumerated as follows:

1. *Economy of water transportation.*—Economical water transportation facilitates the interchange of products between various economic areas both at the seaboard and in the interior (by joint rates and through routes with other carriers). The low price of many basic raw materials precludes their shipment for long distances without low-cost transportation and this is the reason for the carriage of so many raw materials in bulk and an appreciable amount of higher valued commodities by our domestic ocean and Great Lakes vessels.

2. *Extension of markets.*—The economy of water transportation results in lowered production and sales costs with the result that a wider range of markets is assured producers.

3. *Importance to seaports.*—Many of our principal ports transact a larger volume of coastwise, intercoastal and Great Lakes business than of foreign trade and their port development as well as the maintenance of such auxiliary services as warehousing, shipbuilding and repairs, ship supplies, bunkering, freight forwarding, marine insurance, banking, and others, have been and are largely dependent upon the continued operation and services of our domestic ocean and Great Lakes carriers.

4. *Employment.*—The operations of the coastwise, intercoastal, and Great Lakes carriers provide employment for tens of thousands of marine workers and countless thousands of others in the industries and businesses directly or indirectly associated with them.

5. *Industrial location.*—Economical water transportation is a major factor in determining the location of industries, particularly those using the bulk raw materials. Many of the industries using the principal bulk raw materials transported in our domestic ocean and Great Lakes trades—lumber, coal, petroleum, sulphur, naval stores, phosphate rock, etc.—owe their industrial growth, in large measure, to the availability of efficient and low-cost water transportation.

6. *Supply of transportation in national emergencies.*—Domestic water transportation was a decidedly vital factor in relieving the congestion of the railroad transportation due to the exigencies of the first World War in which the United States was a participant. Today, with another great emergency facing the Nation, an adequate supply of ships for the transportation of defense as well as civilian-required commodities has been of essential importance, and the coastwise and intercoastal fleets have been drawn upon liberally to meet the demand for vessels. Without the availability of these fleets the nation would have been faced with an even more serious situation.

The coastwise, intercoastal, and Great Lakes transportation has been and is an integral part of our national transportation system and is vitally essential to the economy and defense of the Nation. The powers invested in our National Government must be so exercised as to permit the sound development of an efficient water transportation service with adequate facilities properly coordinated into the national transportation system, so as to insure to the public the fullest enjoyment of its inherent advantages, both from the point of view of commercial convenience and of necessity for defense.

PART II—SECTION III—HIGHWAY TRANSPORT
1. THE PROVISION OF HIGHWAY FACILITIES

By Wilfred Owen*

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The Highway Problem

Introduction

Providing America with highway facilities involves the expenditure of two and a half billion dollars a year. In this process there are numerous factors preventing a realization of the best possible transportation service. Administrative obstacles are inherent in the vast number and assortment of Government units participating in road work, and the consequent frictions and lack of coordination among them. Legal and financial obstacles are evident in the difficulties of acquiring rights-of-way, in the problems of determining equitable motor-vehicle taxing and regulatory provisions, and in the establishment of grant-in-aid policies to provide an economic distribution and expenditure of motor-vehicle revenue. Political obstacles arise through pressures exerted to direct the highway program to benefit special groups rather than users as a whole; and shortcomings in engineering have been partly responsible for poor designs, bad planning, and failure to make adequate use of existing facilities through intelligent traffic control and other operating methods.

These and countless other items combine to reduce the success with which Government has accommodated the rapid development of highway transportation by motor vehicle. The possibility of eliminating or lessening the impact of the more important of these obstacles is considered in this report to be the direction in which a solution to the "highway problem" may lie.

Highways and Their Use

The fact that there are more than three and a quarter million miles of roads and streets in the United States, and 32 million motor vehicles, is perhaps more interesting than it is revealing. For although possession of half the world's highways and 70 percent of its vehicles constitutes an imposing automotive accomplishment, the magnitude of the highway problem is more meaningful in terms of road types and road conditions and the nature and distribution of traffic. Such a description of American highways might be conveyed in the following abbreviated observations:

(1) In terms of principal administrative classifications, there are three highway systems: State highways, county and local roads, and city streets. The State systems have been designated as the primary intercity and intercounty routes, generally constituting between 10 and 20 percent of total rural mileage, with connecting links through cities. These roads, which include the Federal-aid system, carry a major part of total motor-vehicle traffic. The remaining large mileage of lightly traveled rural roads is for the most part under the jurisdiction of the counties and other local units, with the exception of a comparatively small mileage which has been transferred to the State either as secondary State mileage or as State-controlled local roads. Finally, there are the local streets, within municipalities, carrying a high volume of traffic.

TABLE 1.—*Highway Systems, 1940.*

Class	Mileage [1]	Percent
State primary system	335,000	10.3
State secondary system	88,000	2.7
State-controlled local roads	116,000	3.5
Total under State control	539,000	16.5
County and local roads	2,426,000	74.2
City Streets	[2] 304,000	9.3
Grand total	3,269,000	100.0

[1] Contains 235,000 miles of Federal-aid highways.
[2] Includes some 25,000 miles of connecting links for the State primary system.

(2) The mileage of rural roads having even as much as a low-type surface is but a small part of the total. In 1940, only 1,328,000, or less than half of all rural highways, had a surface of any kind; and 232,000 miles were classified as "primitive." Altogether there were but 191,000 miles of high-type surfaces.

(3) Traffic is highly concentrated on a small mileage of highways, 17 percent of all the roads and streets in the county carrying 87 percent of total vehicle movements. Considering only rural roads, it is believed that if 40 percent of these were improved for all-weather use, they would carry more than 90 percent of all traffic on rural highways, and the designation of such a system "would come pretty near reaching the least important roads that should be improved with

* The author was assisted in the preparation of materials by Dr. David I. Levin, and received valuable advice and criticism from Mr. H. S. Fairbank. Grateful acknowledgment is extended to these and other members of the Public Roads Administration, and to Commissioner T. H. MacDonald, who assigned this chapter.

TABLE 2.—*Highway Surfaces, 1940*

	Mileage
Nonsurfaced roads:	
Primitive	232,000
Unimproved	752,000
Graded and drained	653,000
Total	1,637,000
Surfaced roads:	
Soil-surfaced	107,000
Gravel and stone	774,000
Low-type bituminous	256,000
High-type bituminous	79,000
Portland cement concrete	106,000
Brick and block	4,000
Dual type	2,000
Total	1,328,000
Grand total	2,965,000

public funds."[1] In other words, there would be approximately 1,780,000 miles of rural roads, carrying less than 10 percent of total traffic, which might justifiably be denied further public improvement.

TABLE 3.—*Concentration of Motor Vehicle Traffic*

System	Percent of—	
	Mileage	Traffic
State primary highways and urban connecting streets	11	67
County and local rural roads	83	13
Local city streets	6	30

(4) Motor vehicle traffic is comprised chiefly of short-run movements. Thus in addition to the fact that 30 percent of all traffic constitutes local trips made entirely within city limits, the length of one-way trips outside cities are also for the most part short. Eighty-five percent of all passenger car trips and 80 percent of truck trips are less than 20 miles one-way.

TABLE 4.—*Trip Lengths and Vehicle-Miles Traveled*

Length of 1-way trips (miles)	Percent of total trips	Cumulative percent of trips	Percent of total travel	Cumulative percent of travel
Less than 5	37.5	37.5	6.2	6.2
5–9.9	26.3	63.8	13.1	19.3
10–19.9	20.3	84.1	20.1	39.4
20–29.9	6.8	90.9	11.2	50.6
30–39.9	3.0	93.9	6.9	57.5
40–49.9	1.4	95.3	4.1	61.6
50–99.9	3.1	98.4	15.5	77.1
100–249.9	1.3	99.7	15.1	92.2
250–499.9	.2	99.9	4.2	96.4
500–999.9	.1	100.0	1.7	98.1
1,000 and over	(1)	(1)	1.9	100.0

[1] Less than 0.1 percent.

Source: "Preliminary Results of Road-Use Studies," R. H. Paddock and R. P. Rodgers, *Public Roads*, May 1939, p. 45, *et seq.*

(5) The impossibility of constructing highway facilities fast enough to accommodate the rapidly increasing numbers and improving performance of motor vehicles has meant inevitable lag in the provision of adequate highway service. As a consequence, the inherent safety, speed, and economy of motor transportation has not been fully developed. At the same time the effectiveness of efforts to meet the growing demand for facilities has been diminished by timidity and lack of vision in the conception of highway programs, and by the usual delays of public action. The effect of these conditions is evident in the toll of highway accidents, in urban congestion, and in high operating costs.

The highway problem, then, involves the task of providing facilities to permit safe, speedy, low cost transportation, mostly of a short-run nature, by thirty-two million vehicles. The solution is encompassed in no one remedy, but rather in a host of related factors which together constitute highway policy. A brief description of public administration and financing of highways will precede a discussion of some of the more important aspects of current policy and the criticisms which challenge it.

Public Action

Federal Activity

Although the States and local jurisdictions have been the major promotional agents for highways, the Federal Government has been an increasingly important financial and administrative factor. Federal participation has involved the construction of highways and bridges on the Federal primary and secondary systems; railroad-highway grade-crossing elimination and protection; and construction of roads in national parks, forests, Indian reservations, and other Federal areas; and work-relief, particularly on secondary rural roads and city streets. These several types of Federal activity vary widely in amounts spent and in methods, objectives, and results of expenditure. But during the past 25 years, total Federal expenditures for highways have exceeded seven and one-half billion dollars; and the recent ascendancy of Federal influence is evidenced in the fact that six of the seven and one-half billions have been made available since 1932.

Evolution of Federal aid.—Although the first Federal road construction was undertaken in 1806 when Congress appropriated funds for improving the National Pike, the modern era of Federal action did not begin until 1893. At that time the farmer was demanding highways over which his products could be carried to the railroads, and bicycle riders were becoming belligerent over the discomforts of riding on unimproved roads. In deference to these complaints the Congress appropriated a small sum of money in 1893 "to make inquiries in regard to the systems of

[1] T. H. MacDonald, Testimony on H. R. 7891, 1940, p. 200.

road management throughout the United States" and "investigations in regard to the best methods of road-making."

Following this educational and research activity, in 1913 Federal interest in highway development was again extended to direct participation in roadbuilding for the purpose of improving rural post roads designated by the Post Office Department. This policy was later supplanted in the Federal Aid Road Act of 1916 by a permanent plan of cooperation between the States and Federal Government, with funds appropriated for a 5-year road program to improve rural highways "over which the United States mails now are or may hereafter be transported," and "for other purposes." This program now applies to over a quarter of a million miles of highway designated in accordance with provisions of the Federal Highway Act of 1921. Each State highway department at that time undertook to determine an integrated system of the most important interstate and intercounty highways, up to 7 percent of total State mileage, which would be eligible for Federal aid. Additions to this system have been permitted as the improvement program has progressed.

The mechanics of Federal aid provide that appropriations be divided among the States on the basis of area, population, and rural post road mileage, and that Federal grants generally be matched by equal amounts of State funds.[2] The State highway departments actually perform the work, subject to the approval and supervision of the Public Roads Administration. Federal-aid funds are confined to construction, and grants are contingent upon the maintenance of improvements to Federal standards.

Extension of Federal-aid program.—Federal activity was confined to the improvement of this system of rural Federal-aid roads until 1933, when as an emergency measure the program was broadened to include secondary roads and the expenditure of Federal funds on municipal extensions of the Federal-aid system. Secondary roads are described as farm to market routes, rural free delivery mail roads, school bus routes, mine-to-market roads, and other roads of "community value"; Federal interest thus being expressed in the objective of serving "the greatest number of farm homes and rural businesses" and the various "social interests of the community." Up to this time the secondary program has involved only a small amount of Federal funds. For each of the fiscal years 1938 and 1939 the Federal appropriation was $25,000,000, and this amount was reduced to $15,000,000 for 1940 and 1941.

Another function of Federal activity has been the elimination of railroad-highway grade crossings. Although grade-crossing separations had been completed in large numbers as part of the regular Federal-aid program, under the Emergency Relief Appropriation Act of 1935, 200 million dollars was made available for this purpose. Beginning with the 1938 Federal-aid authorization, a special sum has been made available, amounting to 50 millions for each of the years 1938 and 1939, 20 million for 1940, and 30 million for 1941. Grade-crossing funds are outright grants to the States, and are apportioned one-half on the basis of population, one-fourth on railroad mileage, and one-fourth on Federal-aid highway mileage.

Emergency road programs.—In addition to these continuing Federal-aid programs, the Federal Government has also directed a very substantial part of its emergency and relief expenditure to roadbuilding. In the period since 1930, over a billion dollars of emergency construction money has been spent under the supervision of the Public Roads Administration. In addition, since 1933, agencies other than the Public Roads Administration have spent some four billion dollars on highway projects to provide employment. Most of this sum was controlled through the Work Projects Administration, which accounted for $3,195,000,000 of expenditure from April 1935 through 1940. This program to provide employment has involved work on 517,000 miles of roads, mostly rural secondary.

Other Federal action.—In addition to activities directly connected with grants for the regular Federal-aid and secondary systems, and for grade crossings, the Public Roads Administration has conducted a number of other functions, among them being research and planning activities, defense road work, and assistance in the building of the inter-American highway.

Research: Investigations included in the research program of the Public Roads Administration are of two general classes. Studies under the Division of Tests are directed to physical problems involving road materials, construction, and design. The Divisions of Highway Transport and Control, on the other hand, study the road as a transportation facility, and are concerned with matters of finance, economics, and planning. The central objective of all researches is to assure the provision of more efficient transportation service, whether it be by improving the quality of concrete or by establishing more satisfactory methods of finance.

For physical research, the Public Roads Administra-

[2] In States having large areas of public lands, however, the percentage of the Federal contribution is much higher, and appropriations for the improvement of national forest and park roads increase the Federal contribution in a number of States. Other exceptions to the equal matching basis have been permitted during the depression period, when matching requirements were cancelled altogether because of the inability of the States to assume additional financial burdens.

tion maintains its laboratories in Virginia, near Washington, D. C. Cooperative research projects are also conducted with State highway departments and universities. Among the major physical investigations under way are tests relating to road subgrades, bituminous materials, concrete, pavement surfaces, and bridge design. Economic research is directed to various studies of traffic, safety, vehicle operations, maintenance costs, and the like. It may be said, however, that all investigations are fundamentally economic in nature, inasmuch as the ultimate goal is always a better quality of highway service at lower cost.

Planning: The Public Roads Administration has been particularly active in the field of planning. In 1935 the so-called State-wide highway planning surveys were initiated, these being factual studies carried out by the States, in cooperation with the Federal Government, for the purpose of establishing background data which would permit the formulation of adequate highway plans. The surveys include a detailed inventory and mapping of the present highway system, revealing the mileage, location, type, and condition of all the roads within a State. This picture, combined with detailed description of motor-vehicle operations, has provided valuable material for estimating future highway requirements. Studies of public finance, and highway financing in particular, have furnished a basis for determining the possibilities of meeting these requirements. While each State survey is designed to give a detailed analysis of the highway problem for 1 year, short-cut methods are being devised to keep the facts up-to-date.

An outstanding result of the highway planning surveys has been the master highway plan submitted by the President to the Congress in 1939.[3] Prepared by the Public Roads Administration, this report was based upon the findings of the planning studies in the various States, and has provided for the first time a complete description of our national highway needs and the corrective measures necessary to bring them to standards considered desirable. After revealing that a transcontinental system of toll superhighways would neither pay its way nor alleviate present day traffic problems, the report offered a "master plan" for the development of a system of direct interregional highways "with all necessary connections through and around cities, designed to meet the requirements of the national defense and the needs of a growing peacetime traffic of longer range."[4] Attention is also directed toward the modernization of the Federal-aid system as well as the improvement of secondary roads properly integrated with land-use programs. Since existing legal and financial restrictions on right-of-way acquisition are obstacles to the adequate development of highways and streets, it is further suggested that a Federal Land Authority be created, empowered to acquire, hold, sell, or lease lands "necessary or desirable" for highway purposes.

Defense: Since 1921, War Department specifications and cooperation with the Public Roads Administration have had an important bearing upon the design and development of the Federal-aid highway system. Today, in addition to the growth in highway traffic resulting from increased industrial activity, a new responsibility of the roadbuilder is the provision of facilities for a vastly augmented military traffic and for the rapid creation and expansion of defense plants and the establishment of new military reservations. The Public Roads Administration accordingly prepared a report on defense highways for submission by the Federal Works Administrator to the President. The most immediate task was reported to be the construction of access roads, involving a preliminary 2,594 miles, and the correction of deficiencies on the strategic network of 78,700 miles designated by the War Department as necessary for the national defense. A partial survey of this system indicated that 5,095 miles needed to be widened, 14,000 required high-type surfaces, and 2,436 bridges would have to be strengthened.

Inter-American highway: The Public Roads Administration is also concerned with the promotion of foreign highway facilities. United States cooperation with the countries to the south has been granted to further the development of a 3,267-mile link between this country and Panama. This road system, which is more than half completed with all-weather surfacing, is but one link in the proposed Pan-American Highway to extend from Alaska to the southernmost point of South America. Today, three-quarters of the South American section is passable during all seasons, but the North American section through western Canada to Alaska is still in the planning stage.

Other Federal activity on behalf of the development of Central and South American highways has been the loaning of money by the Export-Import Bank, and of engineering personnel by the Public Roads Administration.

Conclusion.—Federal activity in the provision of highways has multiplied to a phenomenal degree during the past decade. Of total Federal funds authorized to be spent through the Public Roads Administration from 1917 through 1941, two-thirds, or $2,471,000,000, was authorized in the last 10 years. In addition, there has been a total of some $4,000,000,000 of WPA and other relief funds appropriated for roadbuilding since

[3] *Toll Roads and Free Roads*, H. Doc. 272, 76th Cong., 1st sess., 1939.

[4] For a complete picture of this proposal, see H. E. Hilts, "Planning the Interregional Highway System," *Public Roads*, June, 1941.

1933. These vast sums of money made available during the past decade, together with extensions of Federal administrative functions and controls, mark a new era in Federal highway influence.

State Highway Activity

The States are the principal direct action agencies in charge of highway building. Each State maintains a highway department which is in full control of the construction and maintenance of the State highway system. Previous mention has been made of the fact that these systems comprise the most important mileage of intercity routes and that many States in addition control secondary State highways and county roads which have been transferred to the State. The State highway departments also cooperate with the Federal Government in the expenditure of Federal-aid appropriations, and they are responsible for the maintenance of the Federal-aid system to Federal standards.

Sources of funds used by the State highway departments include Federal aid, motor vehicle registration fees, gasoline taxes, the proceeds of bond issues, and a small amount of general funds and property tax revenues. In 1939, total State highway income was $1,144,000,000, approximately double the amount available in 1924. This was made up chiefly of gasoline tax receipts and motor vehicle fees, which together constitute more than 70 percent of total revenues. The changes in amounts and sources of State highway income over a 15-year period are noted in table 5.

TABLE 5.—*State Highway Income, 1924, 1939*

Source	1924	1939
Total income	$555,397,000	$1,144,064,000
General State funds	20,084,000	2,876,000
State property tax for roads	18,283,000	572,000
Motor vehicle registration fees	174,817,000	244,074,000
Gasoline tax receipts	47,811,000	589,037,000
Federal aid	91,401,000	189,679,000
Bonds and notes	101,653,000	62,484,000
Miscellaneous income	101,348,000	55,342,000

Expenditure items included in the 1939 budgets of the State highway departments, in the order of their importance, were capital outlay, maintenance, debt service, transfers to local roads and streets, administration, engineering, and equipment. The total of these expenditures was well over a billion dollars. Expenditure trends indicate the growing importance of maintenance and debt service.

An important function of the State highway departments and other State agencies involves the distribution to local units of government of State grants-in-aid for roads and streets. In recent years this activity has increased to an important degree, amounting to $302,000,000 in 1939. Although control over the use of these grants by local units has not been well established in all instances, many States maintain strict account of local State-aid programs.[5]

TABLE 6.—*State Highway Expenditures, 1924, 1939*

Purpose	1924	1939
Total expenditures	$605,665,000	$1,126,929,000
State highways:		
Total	559,601,000	811,656,000
Capital outlay	382,336,000	467,392,000
Maintenance	104,806,000	206,014,000
Administration, engineering, and equipment	50,958,000	52,017,000
Debt service	38,895,000	202,758,000
Transfers to local roads	28,670,000	154,085,000
Miscellaneous		44,663,000

Local Road Activity

In addition to Federal and State provision of highway facilities, large-scale roadbuilding efforts are carried on by local units of government, including counties, townships, and municipalities. Counties and townships have jurisdiction over two and a half million miles of rural roads, mostly serving light traffic, with municipalities conducting work on city streets. Local rural road expenditures in 1930 were reported to be $852,000,000, and additional large sums were spent for city streets, while in 1938, estimated expenditures were $972,000,000 for local roads, and $714,000,000 for streets.

In spite of the continuing large expenditures for highways in these categories, the role and influence of local jurisdictions in the provision of road and street facilities has declined considerably with increasing state and Federal financial participation. Thus, the decline in the yield of the property tax during the depression decade made it necessary for the States to assume responsibility for many miles of local roads and precipitated increasingly large State grants of road aid to local units. In addition, the concentration of Federal work-relief expenditures upon roads under local jurisdiction shifted a large part of the local road burden to the Federal Government. Except where complete State centralization of the highway function has occurred,[6] however, local agencies continue to serve as operating units, with managerial and financial responsibilties gradually trending toward State and Federal centralization.

Results of Public Action

Federal, State, and local efforts directed to the provision of highway facilities during the past quarter of a century have resulted in commendable achievements.

1. A Federal-aid system of 235,000 miles has been

[5] For a summary of state control of highway grants-in-aid to local units, see Highway Research Board, Report of the Department of Finance, *19th Proceedings*, 1940.

[6] For a discussion of highway centralization, see the Report of the Department of Finance, Highway Research Board, *18th Proceedings*, 1938.

developed to the point where but 6 percent remains unsurfaced.

2. As a result of Federal requirements, every State now has a highway department in charge of the most important highways, and progress has been laudable in the direction of uniformly high standards of design and maintenance and in the creation of productive Federal-State cooperative relations.

3. A secondary Federal-aid system is now being designated by the States to make possible a concentration of efforts upon those routes most important as feeders to the main roads. This system will comprise 10 percent of total rural road mileage.

4. Federal-aid grade-crossing authorizations up to the end of the calendar year 1940 had resulted in a grand total of 15,372 crossings eliminated or protected.

5. By the end of the fiscal year 1940, 1,836 miles of public land roads and 7,047 miles of forest roads had been improved through Federal appropriations.

6. Federal-State cooperation with the War Department has permitted the improvement of the strategic highway network in accordance with defense requirements, so that today this 78,700-mile system has to a large extent been made adequate to serve the rapidly growing military traffic. Further improvements of the strategic highway network, together with the construction of access roads to serve defense industries and military establishments, are now receiving the combined attention of all highway agencies.

7. Federal-State planning survey activities have provided the first accurate picture of highway conditions and use, and this has led to the proposal of a national plan for an interregional highway system, and to separate plans for state-wide highway development. The President has recently appointed a seven-man committee to prepare detailed plans for the interregional network.

8. Highway research has led to extensive improvements in road design, construction methods, and the quality of road materials. These developments have permitted better roads at considerably lower cost.[7]

In spite of these and other substantial accomplishments in the provision of highways, the failures and shortcomings of public action are none the less abundant.

1. Numerous deficiencies exist in the highway system today, including weak bridges, narrow roads, poor surfaces, sharp curves, steep grades, inadequate sight distances, dangerous intersections, and other obstructions to safe and efficient vehicle operation.

2. Inadequate highways and failure to provide for their proper use constituted an important factor in the 1940 accident toll of 34,500 highway deaths and 1,200,000 nonfatal injuries.

3. The lack of necessary street capacity, neglect of traffic engineering, and failure to provide parking and terminal facilities in conjunction with the urban highway system have made traffic congestion a major problem and a serious financial threat to every American city.

4. The expenditure of highway funds is frequently based upon considerations other than the needs of traffic, with the result that some roads are overdeveloped and others undeveloped, producing highway transportation service of poorer quality at higher cost.

5. Road abandonments, piecemeal developments, failure to provide for stage improvements, reliance upon outmoded design, and the lack of highway protection against damaging uses of abutting land, indicate in part the failure to plan on a broad basis to include all government units and general public objectives.

6. The vast number of highway administrative units and their frequent incapacity for conducting economic highway operations often make impossible the accomplishment of an integrated and low-cost highway program.

7. The influence of political pressure, particularly in the matter of personnel turnover and improvement priorities, too frequently overshadows economic considerations in the provision of highway facilities.

8. The acquisition and financing of rights of way adequate for the highway development program continue to forestall the realization of desirable improvements.

These and other criticisms which might be directed to public provision of highway facilities suggest the need for investigating a number of current problems relating to highway design, operation, administration, and finance.

Critique of Highway Policy

The belief that current promotion of highway facilities by the several levels of government fails to achieve the results potential in such large-scale public effort suggests that thinking be directed to ways and means of realizing a greater return per dollar of highway expenditure. By a "greater return" is meant a fuller provision of the safety, speed, and economy which are inherent in motor transportation. Some of the obstacles which are preventing maximum realization of these service elements could be readily overcome if their nature and remedy were clearly understood.

Safety

The most glaring inefficiency of current highway transportation service is reflected in the toll of motor

[7] For a review of highway price trends, see *Federal Aid Highway Act*, H. R. 8838, 75th Cong., 3rd Session, 1938, p. 333.

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vehicle accidents. Traffic accidents in the past 10 years have resulted in over a third of a million deaths. In 1940 the highways of the United States claimed 34,500 lives, and motor vehicles inflicted 1,200,000 nonfatal injuries, 90,000 of these causing permanent disability.[8] In addition, property damage was enormous, and the insurance bill paid by motorists exceeded a third of a billion dollars. Such a record reflects an appalling waste of human and material resources.

Highway accidents involve deficiencies not only in the highway, but in the driver, the pedestrian, and the vehicle. The provision of safer highways, therefore, is but one element in a comprehensive approach to the safety problem; yet the success with which each separate element is treated is of such importance to the over-all result that highway administrators must be concerned with them all.

An encouraging fact about the accident picture is the wide variation in accident rates in different localities, which appears to indicate that some of the conditions which permit low rates in one place, if they could be established elsewhere, might carry with them similarly good results. For example, one state had a 1940 fatality rate of 5 deaths per 100 million vehicle miles, while the death rate in another State was 4 times as high. This diversity was even more striking in cities, for communities with a population between 100,000 and 250,000 had anywhere from 5 fatalities per 100,000 inhabitants to 32.

The driver.—Although many engineering safeguards may be taken to help the driver keep out of trouble, in the last analysis safety on the highways depends upon the none-too-reliable human nature of 45 million motorists. A cursory glance at today's traffic behavior is convincing evidence that no overstatement was involved in the recent estimate that between 8 and 10 million drivers do not know how to drive.[9] And the fact that some States still issue driver permits without examination, or fail to require a permit, is only one obvious reason. Another is poor public management of the whole safety problem as it relates to the driver. Nonuniformity of traffic laws, divided responsibility for traffic safety, and the inadequacy of many traffic courts often make a mockery of safety efforts in other directions.[10] The importance which the traffic courts might have as safety instructors for the 4,500,000 persons brought before them each year remains largely unrealized.

In addition to the general failures of the driver and of driver controls, there should be mentioned two special driver classes which contribute a disproportionate share of motor vehicle accidents. One is the drinking driver, who is held to be involved in one out of every nine fatal accidents. There is also a small group of so-called accident-prone drivers, who account for a disproportionately large number of traffic mishaps. An investigation of Connecticut accident records, for example, revealed that accident repeaters, constituting 4 percent of total drivers, caused 40 percent of the fatalities and were involved in 36 percent of all reported accidents.[11] Further apprehension and control of the drinking driver, and the education or exclusion of the accident-prone driver, would undoubtedly constitute forward steps toward greater safety.

The pedestrian.—While the reckless driver is a frequent cause of traffic accidents, the reckless pedestrian is also an important factor. There were 12,500 persons killed afoot in 1940 and a quarter of a million injured. Pedestrian accidents have been found to be more numerous where proper facilities for traffic control are lacking, such as traffic police, traffic signals, pedestrian islands, and cross walks.[12] Pedestrians involved in accidents are most frequently in the age group above 45. Another consideration to guide the pedestrian safety program is the fact that the majority of pedestrians killed are unfamiliar with motor vehicle operation. At least 5 special investigations reveal that only 1 or 2 of every 15 pedestrians killed were licensed automobile operators,[13] which would seem to indicate that persons ignorant of driving are unaware of the limitations of the driver and the vehicle.

Although educational programs, especially in the schools, are having a salutary effect on the pedestrian-accident rate, there remains in most cases the need for effective regulation of pedestrian movements. At least 80 cities are now attempting to enforce some type of walking rules. Until further measures along this line are successful, the effort to reduce pedestrian hazards by such means as traffic signals, markings, street illumination, and the like must remain only partially effective.

The vehicle.—While safety is being built into the vehicle to a greater extent than ever before, it remains axiomatic that automobiles must be kept in proper condition to maintain the highest degree of dependa-

[8] In the first 6 months of 1941 there was an increase of 2,390 highway deaths, or 17 percent, over the same period in 1940. "The American public has good reason to be ashamed—." *New York Times*, editorial, August 10, 1941.

[9] Automotive Safety Foundation, *Priority for Traffic Safety*, 1941.

[10] A report on traffic courts by the National Committee Conference of Judicial Councils mentions disgraceful physical inadequacies, archaic practices, lack of attention and common courtesy, and summary proceedings more like a "shakedown" than impartial justice. *New York Times*, editorial, July 20, 1941.

[11] *Motor Vehicle Traffic Conditions in the U. S.*, Public Roads Administration, "The Accident Prone Driver," H. D. 462, pt. 6, 1938.

[12] Such instrumentalities are an important possibility, since two-thirds of all pedestrian accidents occur in cities and towns.

[13] National Safety Council, *Accident Facts*, 1940, p. 41.

bility. The way in which proper vehicle condition can best be maintained is a subject of considerable controversy, but 23 States now require periodic vehicle inspections to enforce minimum standards of condition; and the results of such inspections reveal unmistakably the extent to which mechanical defects are a potential source of accidents.[14] In the first 3 years of car inspection in New Jersey, 45,000 vehicles definitely ruled unsafe were prohibited from using the highways. The Virginia Motor Vehicle Department in 1939 rejected 60 percent of all vehicles registered, and a high percentage of rejections was recorded in Massachusetts. The most frequent defects are generally bad lights and bad brakes.

It is often declared that the defective vehicle plays but a small part in the accident picture, and that vehicle inspections have failed to reduce accidents. Lacking any convincing data, however, public officials may well take the logical position, until reliable facts rule otherwise, that the safe condition of vehicles is closely related to their safe use on the highways.

In addition to the operating condition of the vehicle, truck sizes, weights, and types of equipment are important elements in safety.[15] The factors to be considered include physical dimensions, structural characteristics of the vehicle, the weights placed on them, the distribution of such weights, and the performance of various types and sizes of vehicles in terms of speed, ability to ascend grades, ability to stop, and ease of maneuvering.[16] Regulation of sizes and weights should be predicated on the extent to which such regulations are believed to be in the interest of safety, and in accordance with the physical limitations of the road. They should not constitute an indirect method of restricting highway operations for the benefit of competing forms of transportation.

The road.—The road as a factor in the safety of motor vehicle transportation may be considered both from the viewpoint of efficient operation and maintenance of the existing highway system, and from the viewpoint of design improvements in the provision of new facilities. The former consist of such items as adequate signs, traffic signals, pavement markings, speed control, policing, one-way streets, parking restrictions, proper maintenance, and lighting. Design improvements include the construction of grade separations, dual highways, traffic circles, and the elimination of steep grades, sharp curves, and other potential accident sites.

A number of accident studies have been made to demonstrate the effects upon the accident rate of improvements in highway operation and design. The State of Connecticut, for example, compared the annual accident toll before and after the adoption of recommendations made by traffic engineers to improve conditions at dangerous locations. The types of improvements and the accident reductions are as follows:

Type of control:	*Percent accident reductions*
Rotary traffic circles	47
Boulevard stop system	35
Traffic signal lights	14
Warning signs and markers [1]	33
Others: parking control, 1-way streets, etc	26

[1] Marking highway curves with safe speed indications has had notable safety results in a number of States. On a 95-mile section in Indiana in 1939 and 1940, there were 10 fewer fatalities, 12 fewer injuries, 36 fewer accidents on curves, and approximately $9,000,000 less property damage during the 12-month period in which the signs were up than in the previous 12 months.

At locations where safety recommendations were not adopted, accidents increased 8.4 percent. State-wide accidents decreased 5.3 percent over these periods of comparison.

The separation of opposing traffic lanes has been one of the most successful methods of accident prevention on heavy traffic routes. In New Jersey the conversion of two routes from undivided to dual roadways was a significant factor in reducing the number of accidents per year on these roads from 41 to 23;[17] and in Delaware the construction of a divided road between Dover and Smyrna was accompanied by a reduction in the annual toll from 28 accidents and 7 fatalities to 15 accidents and no fatalities.[18]

Safety has been promoted on a number of main routes by the provision of effective overhead lighting. More than half of all fatal highway accidents in the United States occur at night, although traffic after dark is much less than in the daytime. In New Jersey the importance of good lighting has been demonstrated by comparing the accident rate on lighted and unlighted roads. On the lighted route the accident rate

[14] A study of motor vehicle inspections, under the direction of the Public Roads Administration, is contained in *Motor Vehicle Traffic Conditions in the U. S.*, H. D. 462, part 4, 1938.

[15] *Sizes and Weights of Motor Vehicles in Relation to Highway Safety*, Report No. 3, Ex Parte M. C. 15, I. C. C., Bureau of Motor Carriers, June 1940.

[16] Extensive studies are now being made of truck performance on grades by the Public Roads Administration, with the objective of recommending minimum standards of performance as a basis for regulatory action. The performance of brakes is also being investigated with the advice and cooperation of vehicle and brake manufacturers.

[17] *Highway Research Abstracts*, "Divisional Islands," October 1937 p. 1.

[18] A further comparison of accident rates was made between the Philadelphia Pike, a four-lane undivided road, and the Dupont Boulevard, a dual road. The former accounted for 58 percent more accidents than the latter. *Highway Research Abstracts*, "Accidents on Dual Highways," June 1937, p. 9.

at night was less than three mishaps per million vehicle miles, which was lower than the daytime rate. However, on three unlighted routes, where the daylight average was little more than two accidents per million vehicle miles, night accidents rose to eight per million vehicle miles.[19] It should be pointed out, however, that the high cost of lighting generally limits it to short sections on heavily traveled routes.

Numerous other examples demonstrate how the correction of deficiencies in the design and operation of the highway can in large part overcome the effect of other accident factors, and that the improvement of the road has a much greater role in safe highway transport than many safety experts have been willing to concede.[20] It is believed that greater emphasis on safety considerations in the programming of highway expenditures would produce further salutary results.[21] Combined with appropriate attention to the driver, the pedestrian and the vehicle, and with a more intelligent administrative and judicial system, emphasis on safe highways could readily achieve a vast improvement in the efficiency of motor transport.

Speed

In addition to the safety of goods and persons, an efficient transportation system must provide for swift movement from origin to destination. This means not only that line operations must be speedy, but terminal operations as well; in other words, that the over-all time which elapses between the start and completion of every trip must be at a practical minimum.[22] Such an objective is partly in opposition to considerations of safety, since accident reports show that excessive speed, or speed "too fast for conditions" is a frequent contributing cause of motor vehicle accidents. It is also to some extent in conflict with considerations of economy, since higher costs may result from high speed. A nice adjustment between provisions for greater safety and greater speed is therefore one of the difficult tasks in directing the highway program.[23]

The maximum speeds of passenger cars on the road in the United States have increased about 60 percent since 1926, and top speed observed in traffic is now close to 90 miles per hour.[24] Speeds of commercial vehicles, while increasing, are considerably below these figures. This upward trend in the rate of movement on rural highways has presented a continuing challenge to the ability of highway administrators, who are called upon to provide facilities adequate to accommodate the ever-changing performance of the vehicle.[25] On rural roads the results of these efforts are attested by the high average speeds which have been attained; but in urban areas heavy traffic volumes and inadequate accommodations result in such congestion that traffic is often at a standstill. Analysis of traffic in cities indicates that average speed will drop as low as 4½ miles per hour during hours of congestion in business districts. Recent urban speed investigations in Boston indicated that approximately 7 minutes were required to move a mile, of which 2½ minutes were accounted for by stops, 1½ by travel in first or second gear, and 3 minutes in high gear.[26] The average trip speed was 8½ miles per hour. "When one observes the countless impediments that embarrass the movement of twentieth century traffic through the eighteenth century streets of some eastern cities one wonders how long it will be—before complete congestion will result."[27]

That greater speed and consequent time savings have a real value to the motorist when their magnitude is sufficient has been frequently demonstrated. For example, motorists prefer to pay twice as much to use the Holland Tunnel as the slower ferry crossing.[28] That speed has value to the businessman is demonstrated by the emphasis placed upon fast service by truck, which permits speedy filling of orders, lower inventories, and less overhead.[29]

There are a number of ways in which the speed of highway transportation can be increased. Among them are such measures as the timing of traffic lights,

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[19] Los Angeles reports that prior to the installation of sodium vapor lamps at 25 intersections, there were 91 collisions in 1 year. After installation there were but 20 in 2 years.

[20] A summary of accident experience before and after highway design improvements in a number of States is contained in the Report of the Committee on Analysis of Accident Data, *Proceedings, American Roadbuilders Association*, 1940, pp. 203–237.

[21] According to Arnold H. Vey, traffic engineer for the State Highway Department of New Jersey, in a paper presented to the American Society of Civil Engineers, "By applying known highway improvements such as controlled rights-of-way, physical separation or segregation of conflicting flows of traffic, adequate shoulders for stopping, pedestrian pathways and modern lighting, it would be possible to reduce accidents by 75 percent."

[22] According to Charles H. Cooley, writing in 1894 for the American Economic Association, "Speed and cheapness never cease in the most complex development of transportation to be the simplest tests of its efficiency."

[23] According to the former State Highway Commissioner (and now Governor) of Michigan: "The State Highway Department is faced with the almost unanimous desire on the part of motorists for greater speed. We find this expression of speed in every phase of modern times; in business, industrial, and social activities."

[24] R. G. Paustian, *Speed Regulation and Control on Rural Highways*, Highway Research Board, 1940, p. 74.

[25] Upward revisions in highway speed regulations were effected in seven States during the 1941 legislative sessions.

[26] Not only did Boston congestion result in time losses, but fuel consumption on the most congested runs was 50 percent higher than for uninterrupted driving.

[27] *Toll Roads and Free Roads*, p. 95.

[28] The San Francisco-Oakland Bay Bridge is reported to save the motorist 26 minutes a crossing.

[29] In 1934, the *Merchandise Traffic Report* of the Federal Coordinator of Transportation revealed that faster service was the most important reason quoted by shippers for using trucks.

the superelevation of curves, reduction of grades, widening of surfaces, crossing eliminations, the provision of passing lanes, minimum speed laws, special truck routes, and other steps which increase speed by increasing capacity. Two of the most essential and large-scale of these efforts to provide faster transportation concern the provision of so-called superhighways and of parking facilities.

Superhighways.—The desire for greater speed has been an important factor in the creation of safe and fast multiple-lane highways, built according to the highest standards of grade and alinement, with opposing traffic separated by a center parkway, with cross traffic eliminated, and with access from side roads permitted only at carefully selected points. The latter qualification pertains to the so-called limited way or "freeway," which requires the passage of special legislation to deny access from abutting land;[30] while the separation of opposing traffic lanes and of cross traffic are in the nature of special engineering design rather than legal restriction.

An illustration of the speed superiority of the superhighway over the ordinary road was computed in Germany by an interesting comparison between a 92-mile section of the German motor road system and a roughly parallel State road 101 miles long which connected the same cities. The latter was in good condition and well-constructed for long-distance trips, but the route passed through three large towns and 32 other localities, and there were 219 crossings and 744 branch roads. A trial run on each of these routes revealed that the time elasped was 2 hours 16 minutes on the ordinary road and 1 hour 14 minutes on the motor road. Average speeds were 44 and 74 miles per hour respectively.

Commonly associated with the term "superhighways" are the visionary proposals for transcontinental routes frequently made in connection with plans for large-scale public works. Promotion of coast-to-coast motor roads, however, generally derives from the philosophy that public works should have at their primary objective the furnishing of employment rather than the creation of additional wealth. Based upon this untenable assumption, the proponents of transcontinental schemes are able to overlook the fact that there exists no important volume of transcontinental travel, and that the real problems of providing facilities to move high traffic volumes at reasonable speed lie in a different direction. For the construction of high-cost superhighways is obviously justified only where traffic cannot be properly accommodated by ordinary roads, this being chiefly within and approaching concentrations of population, or between such centers when they are sufficiently close to generate high-volume traffic. Time-honored examples of the need for superhighway design are afforded by the experience of driving between Baltimore and Washington, D. C., or through the city of Baltimore. In fact, the entire distance between Washington and Boston has for some time been considered deserving of extraordinary attention, as have other congested routes, especially in the East, Middle West, and on the Pacific coast.

That there is a desire for greater speed than is generally possible today is indicated by study of operations on a two-lane road compared with those on a four-lane superhighways. On the two-lane road no vehicle was found traveling over 60 miles per hour even in traffic as low as 200 vehicles per hour in both directions; and only 7 percent exceeded 50 miles per hour. On the divided highway, however, with similar traffic volume, 5 percent of the vehicles exceeded 60 miles per hour and 37 percent exceeded 50.[31]

It should be pointed out that considerations of speed do not imply that public funds must be spent to convert the highways into race tracks. For the value of fast movement is reflected in the total time elapsing, which means that what is needed are facilities to permit uninterrupted travel, which involves maintaining average speed as close as possible to the maximum. It is the intermittent obstruction which causes the motorist to travel at excessive speeds on the unobstructed sections to make up for time losses elsewhere. One of the primary obstacles to the realization of such over-all performance by motor vehicle, in addition to inadequate rural roads and the urban street bottleneck, is the lack of parking facilities.

Parking problem.—To demonstrate the importance of considering over-all speed in providing fast transportation, tests made of the progress of motor-vehicle users from Washington, D. C. suburbs to the downtown districts are appropriate. In one case the average running speed of the automobile was 14 miles per hour, but after the driver had found a place to park, his over-all speed for the trip had been reduced to 9.9 miles per hour. Accounting then for the time spent in walking back to the office, the total average speed for the trip was reduced to 7.3 miles per hour, or approximately half the actual running speed. The provision of parking facilities, then, is an intimate part of providing efficient transportation service. Such facilities, located off the street, perform the double function of providing terminal accommodations and of releasing valuable street space for the movement of vehicles. It is believed imperative in the future that the furnishing

[30] Such legislation was passed in Colorado, Maryland, Michigan, and Ohio during the 1941 legislative sessions. Previous action had been taken in Maine, New Jersey, New York, Rhode Island, Connecticut, California, and West Virginia.

[31] *Toll Roads and Free Roads*, H. D. 2727, 1939, pp. 38–39.

of parking accommodations in conjunction with the street system be considered a public responsibility.[32]

Defense.—The importance of the speed element in highway transportation is illustrated by recent growing significance of motor transport for defense. The creation of a motorized army is a familiar example of the recognition of speed as a primary transportation factor. The defense program has likewise placed emphasis upon the utility of trucks in supplying materials to defense industries, and the importance of the automobile in transporting defense workers to new plant sites where the distance from workers' homes makes swift daily commuting highly essential.[33]

In order to provide the roads for these new defense requirements, both military and industrial, surveys have been made in all the States to determine the deficiencies existing in the system of strategic roads designated by the War Department; and essential access road projects to serve military establishments and industry are being built as rapidly as possible.

Conclusion.—One of the principal components of efficient transportation, then, is the over-all speed of movement from origin to destination. In the case of the driver, such as truck operators, salesmen, and other persons engaged in business, driving time has a very tangible money value. Time consumed by commuters and pleasure drivers may also have value, though this is generally more difficult to evaluate. Finally, time saved in the shipment of goods often permits large savings in the efficient conduct of business. Increasing speed has always been a primary criterion of the development of transportation techniques. Continuing emphasis must be placed upon it if the highway is to maintain its place in the transport pattern.

Economy

The total cost of highway transportation includes the cost of providing highways and of operating motor vehicles. At present the estimated highway transportation bill is some 17½ billion dollars a year, of which 2½ billions are spent for highway facilities and 15 billions for vehicle operation. The realization of economy, then, is possible on the one hand through better roads and more efficient methods of providing them, and on the other hand through reductions in vehicle-operating costs.[34] Since these operating costs are by far the greater item, it would appear that attention directed toward vehicle improvements would effect the more important reductions in over-all costs. Actually, however, the largest operating costs, including gasoline and oil consumption, tire wear, depreciation, and accident losses, are so intimately connected with the type of highway system, that the significance of the highway program in terms of over-all economy is greatly magnified.

There are two approaches by which the highway program can achieve greater economies in motor transport. One is in providing the proper type of facilities; the other is in maximizing the amount of such facilities which can be supplied with a given expenditure.

Types of facilities.—Road surfaces.—Aside from the economic wastes resulting from accident and time losses, operating costs may be high because of excessive fuel consumption and vehicle wear resulting from poor surfacing, difficult alinement, steep grades, congestion, and the like. With regard to surface type, operating-cost records of rural mail carriers in Iowa and Indiana have been analyzed at Iowa State College, with revealing results.[35] Average cost of operation was found to be about 8 cents per mile for earth roads, 5 cents per mile for gravel, and 3½ cents for pavement. This and other studies indicated that for the improvement of an earth road to a gravel surface a traffic volume of 35 vehicles a day would be necessary to justify an investment of $1,000 per mile, and an extra maintenance cost of $40 per year. Also an annual expenditure for snow removal of more than $500 per mile of road per 1,000 vehicles of traffic per day was indicated as economical on these roads on the basis of savings in operating costs, time, and accident reduction.

A cooperative project being conducted by the Public Roads Administration and Iowa State College has also produced some preliminary findings on operating costs for four identical new vehicles, two being operated on gravel and two on concrete. After 260,000 miles of operation it has been found that average gasoline costs on gravel were 10 percent higher than on concrete, oil costs 40 percent higher, tire costs 100 percent more, and car repair costs 150 percent more. Tire punctures on gravel compared with concrete were in the ratio of 49 to 1, while cylinder-bore wear was twice as great, main-bearing wear three times as great, and the connecting-rod-bearing wear almost four times as great.

Superhighways.—The economic loss from congestion and frequent stops on a road of inadequate design has frequently been determined by vehicle-operating-cost comparisons. Traffic tests made in Boston, for example, have revealed that during hours of congestion the test car ran 12.1 miles per gallon in contrast to

[32] "The Problem of Parking Facilities," *Proceedings, Highway Research Board*, 1941, pp. 27–43.

[33] To illustrate the growing demand for highway facilities, traffic on U. S. 99 between Takoma, Wash., and the twin encampments of Fort Lewis and Camp Murray has recently increased from 6,000 to 15,000 cars daily, and side roads formerly carrying less than 50 cars daily now serve 2,000. In addition, activities of the Boeing Aircraft Corporation south of Seattle has more than doubled traffic on this part of Route 99.

[34] The average operating costs of motor vehicles have been reduced from 10 to less than 5 cents per mile in the past two decades

[35] Ralph A. Moyer, *Proceedings, Highway Research Board*, vol 17, pp. 53–78, vol. 18, pp. 41–60.

18.2 miles without traffic interference. It was estimated that if such findings could be used as a basis for calculation, the additional gasoline cost resulting from traffic delays on the streets investigated amounts to about $18,000 per mile per year.[36]

Reference has previously been made to comparisons between vehicle-operating characteristics on the German superhighways and the older state roads. In addition to time saved, computations were also made of the wear on both car and driver during the two test runs. Instruments were installed to record the number of times the speed changed more than 6¼ m. p. h., and how many times the circumference of the steering wheel was turned more than 2.3 inches. Results showed that manipulations of the steering wheel were in the ratio of 570 on the ordinary road to 1 on the motor road, and that there were 440 speed changes during the trips on the ordinary road. The brakes were used 491 times on the state road and 3 times on the motor road.

A second test was run to cover the trip on the motor road in the same time as on the old road, or at an average speed of 44 miles per hour. Because the motor road was free from obstructions, this average was nearly a uniform speed. The most surprising saving was in gasoline consumption. On the ordinary road the trip was made at 14.2 miles per gallon, while on the motor road the car made 13.9 miles per gallon on the fast trip and 22.3 miles per gallon on the slower trip.

Similar studies in New England, comparing operations on the Merritt Parkway and the old Boston Post Road, have demonstrated that the presence of 116 traffic lights on a 48-mile section of the Post Road required 41 stops, or nearly 1 per mile. Comparing this situation with the free flow of traffic on the parkway, it was estimated that for the trip between Pelham Manor, N. Y., and Milford, Conn., the gasoline cost would be the same at 52 miles per hour on the parkway as at 25 miles per hour on the Post Road; and that the parkway trip, in spite of being 2 miles longer (55.5 miles compared with 53.5 miles) would save 40 minutes.[37]

Whether traffic demands the usual two-lane road or a high-capacity superhighway, consideration of the costs of various types of highways, the volume of traffic to be served, and the cost of vehicle operation provide a basis for determining an economical selection of facilities. In addition to these engineering calculations with respect to economy, however, are problems of management which determine whether funds will be available for the desired project, and whether they will be spent in such a way as to assure their most efficient application.

Methods of Finance.—The question of whether highways should be paid for on a pay-as-you-go basis or through borrowing has long been a controversial issue. Today some two billion dollars of State highway obligations are outstanding, in addition to another billion dollars of local road debt. The trend in highway borrowing has been downward, and in 1938 only 17 States were receiving income from bond and note sales, with total funds borrowed amounting to $57,000,000, or slightly more than 1/20 of all State highway income.[38] But while issues of general obligation bonds have been diminishing, particularly in view of tax and debt limits, there has been a corresponding increase in the development of revenue bonds issued on the security of earnings from the specific project financed, and without the backing of general Government credit. Thus, revenue bonds for highways have been secured by a lien on all or part of motor vehicle revenues, while toll authorities have issued so-called agency revenue bonds for high-cost facilities, including bridges, tunnels, and highways.

Two questions of policy arise, therefore, one being the advisability of borrowing and the other the part which tolls should play in highway financing. With regard to bond issues, this method of financing provides current revenues when the tax burden would otherwise be too great to supply a desirable standard of service, permitting an earlier realization of economical motor-vehicle operation. For the lack of adequate funds which may result from strict adherence to current financing in some cases means that both the quality and quantity of highway service must be sacrificed; and because of the consequent accident and time losses, higher costs and inconveniences, it is often stated that the motorist pays for good roads whether he has them or not.

Proponents of the pay-as-you-go system point out, on the other hand, that greater care is exercised in the selection of projects, and there is less tendency toward reckless expenditure when the highway program is dependent upon current tax receipts. They also cite the advantage of avoiding interest payments, and they warn against the frequent danger of mortgaging too large a share of motor-vehicle-user revenues. For since obsolescence has been such an important factor in road life, overborrowing has saddled the motorist with payment for roads no longer in existence and threatened the provision of needed facilities for the future.[39]

[36] A. J. Bone, Massachusetts Institute of Technology, *Proceedings, Highway Research Board*, vol. 19, 1939, pp. 99–125.

[37] *Ibid.*

[38] Peak borrowing by the State highway departments was $222,000,000 in 1930. The year of least borrowing, 1933, accounted for only $28,000,000.

[39] Although the virtues of pay-as-you-go finance have generally been emphasized in the highway field, there has also been considerable criticism of its inadequacies. In one State it was charged that adherence

While it is recognized that there are obvious objections to unwise borrowing, and that all factors must be carefully taken into account before large-scale issue of bonds, there are numerous examples of the salutary results made possible by judicious borrowing. Bridges and tunnels financed in this manner have accounted for some $400,000,000 of revenue bonds, and in addition at least $120,000,000 of public revenue bonds have been issued for highways. It is believed that future large-scale modernization of the highway system necessary to provide efficient service demands that further attention be given to possibilities of borrowing to finance the tasks for which current revenues cannot provide.

Concerning the question of whether bonds should be serviced by motor-vehicle taxes or by tolls, the answer depends largely upon the type of facility. The collection of cash tolls on any extensive scale would obviously constitute a barrier to efficient highway operations;[40] yet such payments for special high-cost projects have generally been a highly satisfactory financial method, and in most cases the alternatives are not so much the use of tolls or some other revenue sources, but rather the use of tolls or the abandonment of the project.

Tolls, of course, need not be paid in cash. It is quite possible that a regional superhighway system might be financed through the sale of special plates or stickers which would permit admission to the superhighway system. Except in limited cases, however, it appears that the toll principle embodied in the collection of highway-user taxes must continue as the basis of supplying funds to service revenue bonds; and cities undertaking special high-cost projects should receive a sufficient share of state-collected revenues to finance such projects.

Aside from questions involved in the matter of borrowing, the chief problem in highway finance is the extent to which motorists and property owners shall share the highway bill. The steadily upward trend in the amount of motor-vehicle tax revenue and the parallel decline in property taxes for highways is well known.[41] Although this trend under ordinary conditions may be expected to continue, it appears that local general funds and property revenues will remain a source of revenue where lightly traveled rural facilities or city streets are chiefly of benefit in terms of land ownership rather than motor vehicle use; and where certain street and highway uses other than the movement of privately owned motor vehicles are involved in the provision of facilities. It is not believed that the percentage of the total street and highway bill to be paid by motor-vehicle-user charges is susceptible to any mathematical solution, but rather that each State must eventually designate a system of roads to be financed by the motorist, excluding, for the sake of fairness, those local facilities which can be supplied only at very high cost per vehicle mile. The application of general tax funds to any part of the highway system would appear to be warranted, however, when general governmental objectives involve additional facilities or greater costs than would otherwise be included in the transportation program.

Distribution of motor-vehicle revenue.—Another problem from the standpoint of economic highway service is that of providing an acceptable programming of motor-vehicle revenue expenditures. For while the raising of highway revenue from motorists in accordance with highway use assumes the expenditure of the proceeds in accordance with traffic requirements, in reality a large part of this money is spent without consideration of motor-vehicle needs in terms of traffic and the cost of serving it. The roots of this problem lie to a considerable extent in the fact that the State is collector of vehicle taxes while not only the State but the counties and cities, among others, are charged with the responsibility of providing highway services. This situation has created competition instead of cooperation among State, county, and municipal agencies each seeking a maximum share of total funds. Obviously, therefore, the resulting distribution is more often a function of the loudness of the demand for funds rather than of any economic consideration of where the money should be spent. Many States grant little or no part of the vehicle tax fund to cities where the greatest needs of the motorist are generally concentrated, while on the other hand there is often an over-generous contribution to local rural units and a corresponding incentive to wasteful expenditure.

A partial solution to the unequal distribution of revenues to various road systems and political units has been attempted in the transfer of local roads to State jurisdiction. Thus the mileage of State-controlled highways has increased from 324,000 miles at the end of 1930 to 539,000 miles in 1939, a process which has frequently involved the entire elimination of county or township roadbuilding units.[42] In this manner it has been hoped that the provision of facilities could be

to pay-as-you-go finance required 46 percent of all highway funds to be spent for maintenance, and that the motorist was "paving plenty and getting very little." Elsewhere it has been stated that pay-as-you-go "sounded fine" as a slogan for politicians, but doubt was expressed that it was practical. "If the pay-as-you-go plan is a good thing then all our business methods must be wrong."

[40] For a discussion of the limitations of toll finance, see *Toll Roads and Free Roads*, pp. 89–90.

[41] State property taxes for roads totaled $34,739,000 in 1921, $10,884,000 in 1932, and half a million in 1939. Local rural road property taxes of $409,000,000 in 1930 have also declined considerably. In three states, for example, the decade of the 30's resulted in property tax declines from 40 to 4 million.

[42] For example, in North Carolina, Virginia, West Virginia, and Delaware nearly all rural roads are under state control; and in Michigan 60 000 miles of township roads have been transferred to county administration involving the elimination of 1,376 small road units.

guided more in accordance with the needs of the whole system, and that the costly wastes and inefficiencies typical of many local jurisdictions might be lessened. For the multiplicity of Government units is not merely a case of too many cooks. The trouble is also that many rural jurisdictions are often of insufficient size and wealth to permit economic highway operations.[43]

The objective of providing efficient administration for highway facilities, then, suggests as possible alternatives a more adequate system of State grants-in-aid to bolster local units, consolidation of these units, or in some cases complete centralization. An adequate grant-in-aid policy would be one which recognized the relative highway financial requirements of the various jurisdictions, and which embodied such administrative controls by the States as would assure a satisfactory application of the funds.[44] The degree to which consolidations or complete State centralization of rural road units might be considered desirable would depend upon such factors as the area and mileage of roads involved, the amount of road work necessary, and the financial conditions involved. The wide variety of circumstances which affect decisions in any State removes the possibility of adopting any general remedy. But there appear to be several principles universally applicable. In the first place, the expenditure of motor-vehicle revenues should be in accordance with traffic rather than political considerations. Secondly, the jurisdiction in charge of road building should be selected according to its economic capacity to perform the work. Finally, there must be satisfactory working relations among highway administrative jurisdictions to permit the highway program to develop on a system basis rather than on the basis of rivalry and competition. It is believed that intelligent study of these possibilities in each State would lead to substantial economies.

Right-of-way problem.—A primary obstacle to the provision of highway facilities on an economic basis has been the combination of prohibitive costs and legal restrictions which prevent the acquisition of necessary rights-of-way. Today many streets and highways which require widening or realinement remain unimproved because of exorbitant land costs; and the construction of new facilities has often been held up indefinitely because of the difficulties of acquiring land. Yet even where rights-of-way have been obtained to permit new construction, failure to acquire sufficient widths, either because of high costs or prohibitions against "excess" acquisitions, has resulted in eventual impairment of the road investment by the encroachments of abutting land users, and in later widening difficulties because of high damage costs and unreasonable real estate prices. The presence of business establishments and residences close to the pavement, and private openings onto the highway at frequent intervals, have been a positive menace to safe transportation and a source of constantly reduced highway capacity. The frequent necessity of building new routes to relieve these bottlenecks produced by inadequate controls over "ribbon development" often leads to no effective solution, for the same condition soon emerges in the new location.

With the transfer of local highways to the States, the highway departments also fell heir to the already ancient laws relating to the acquisition of rights-of-way.[45] Many States today can acquire land only through local road units, and many of these units are still required by law to finance right-of-way costs themselves, despite financial incapacity. In a majority of States, property owners adjacent to proposed highway improvements have the power to delay road development almost indefinitely; and the practice of appropriating funds for land purchase in the same bill calling for construction of the highway means that the States have never had sufficient funds to meet the cost of a desirably prompt construction program and a simultaneous heavy expense for land acquisition. As a consequence, road programs have generally been governed by the limited possibilities of land acquisition.

A further obstacle to intelligent land acquisition policy is the fact that both State and local jurisdictions operate under statutory restrictions as to the maximum width of right-of-way which may be acquired. These limits have generally been unchanged since their establishment before the appearance of the automobile; and where such laws exist it is difficult to acquire widths in excess of the limits regardless of the traffic volumes to be served. Thus, when the acquisition of land in excess of what is immediately needed would assure future expansion and roadside protection, restricted widths must often suffice, to be added to later by purchase of adjacent built-up properties.[46] If this additional width were provided originally, acquisition would be possible at moderate cost.

In spite of its very obvious appeal to common sense, so-called excess or marginal acquisitions which would permit adequate long-range highway developments is

[43] A small unit is generally unable to afford adequate personnel or equipment, or if it could it would probably be unable to utilize either to a degree which would justify the expenditure.

[44] For a summary of State controls over local expenditure of motor-vehicle revenues, see *19th Proceedings, Highway Research Board*, pp. 39–44.

[45] See L. E. Boykin, "Expropriated Rights-of-Way," *American Highways*, April 1941, vol. XX, No. 2.

[46] The cost of urban street widenings offers the most striking example of the land problem. The city of Detroit widened 3 miles of Woodward Avenue at a total cost of $11,128,000, of which $9,806,000 was land costs. In Chicago the widening of Oakland and Western Avenues cost more than one-third of a million dollars for each additional 10 feet of width.

hampered by many constitutional and legal barriers. Although several States have constitutional or statutory authority which permits them to acquire excess lands under the power of eminent domain, this power is used to only a limited extent. Courts have dealt with the constitutionality of marginal land acquisitions in specific cases only, rather than on the basis of the broad principles involved; and on the whole they have not been favorable.

The land problem, which has grown to critical proportions with the developing need for large-scale urban highway developments, led the Congress in 1940 to authorize the Reconstruction Finance Corporation to cooperate with the States in financing the acquisition of rights-of-way "necessary or desirable" for highway projects otherwise eligible for Federal Aid.[47] Although participation by the Reconstruction Finance Corporation appears to constitute a promising step toward dealing with immediate problems, a more desirable permanent measure would be the creation of a Federal agency with sufficient funds and legal authority to acquire lands necessary for highway improvement, which it would make available to State and local governments on a time-payment basis. This type of setup would avoid the restrictions placed upon the States with respect to debt limits, and would circumvent the archaic and time-consuming acquisition processes of the counties. In addition, the basis would be laid for a long-range positive plan of land acquisition which would make possible the public works programs contemplated for the post-defense period. Without such financial and legal assistance in avoiding current obstacles to highway development, it is difficult to foresee any immediate large-scale modernization of the highway transportation system.[48]

Highway employment.—Among the various tests of efficiency in the use of resources for highway development, a foremost consideration is the effective application of human resources. In the past several decades the availability of modern machines has made possible tremendous increases in the productivity of labor, and consequently in the amount of roadbuilding and the high standard of road service. With the employment problem reaching such proportions during the recent depression, however, it became necessary to provide jobs quickly and on a large-scale; and the lack of plans in readiness for such an emergency made necessary a resort to work-relief programs comprising projects having immediate employment rather than ultimate usefulness as their primary objective. As a result, technological advance had to be forsaken for antiquated hand-labor methods, and the desire to create more jobs overcame the desirability of building better roads.

That the application of relief labor to the highways has resulted in substantial improvements cannot be denied. New and reconstructed bridges and pavements, grade crossing protection, drainage facilities, sidewalks, signing, landscaping, and traffic controls have been among the many physical accomplishments of the Work Projects Administration.[49] Up to 1941 the relief program is reported to have involved work on 517,000 miles of roads and streets; and at the end of 1939 there were 903,000 workers, or 44 percent of the total WPA pay roll, engaged on road projects.

The lesson which the WPA experience has taught is sufficient warning of the immediate need for a detailed planning of public works which will provide a ready shelf of worthwhile projects in the post-war era, or in any future time of depression.[50] On the basis of these advance plans, unused factors of production may readily be engaged not only toward the end of providing employment, but of furnishing needed facilities in the most economic manner. For the determination to turn future labor surpluses to greater account in the field of public works perhaps constitutes the most promising possibility of accomplishing on a large scale the physical requirements of an economic highway system.

Summary

Safety, speed, and economy, then, are the factors which, combined with esthetic considerations, make possible the provision of adequate and efficient highway transportation service.

Because they are interrelated in a complex manner, each one simultaneously contributing to and detracting from the other, the organization of the road building function and the programming of highway expenditures becomes a difficult problem of adjustment. To achieve optimum results, all factors must be balanced in such a way as to permit each its maximum development; and although nicety is impossible in such calculations, engineering, and administrative clear thinking must be based upon these underlying concepts. For since the provision of highways is only incidental to the provision of motor vehicle movement, the quality of vehicle operation constitutes the real guide to highway policy.

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[47] Section 12 of the Federal Highway Act of 1940. No loans have yet been made under this authorization.

[48] For a full discussion of the nature and significance of the land acquisition problem, see *Toll Roads and Free Roads*, pp. 114–122.

[49] For a summary of work-relief accomplishments to January 1, 1941, see *Report of the President of the United States to the Congress, Emergency Relief Appropriation Acts, 1935-41*, January, 1941.

[50] See Alvin H. Hansen, *Fiscal Policy and Business Cycles*, 1941, p. 90. Professor Hansen points out that while relief expenditures provide more immediate employment, positive recovery requires stimulation of the production industry, not of consumption purchases. This latter effect is obtained through public works rather than relief programs.

Conclusions and Recommendations

The foregoing statement of highway transportation characteristics and of problems encountered in the provision of adequate facilities is in no way intended as a complete picture of the responsibility of public action in this field. Many further issues would demand attention in a treatment of unlimited scope. The message which this chapter has sought to convey is simply that in spite of substantial achievements, government effort in the provision of highways has fallen far short of furnishing the type of service which the requirements of a motorized nation demand, or which the Nation's wealth would seem to warrant. Engineering vision has too often been subordinated by the persistence of legal, financial, and administrative obstacles which exist only because public inertia prevents their removal. Many current policies are based upon circumstances which modern motor transportation has long rendered obsolete; and the forces of time and habit have too often placed the shortcomings of public action in the category of necessary evils.

In view of the multiplying hazards and inconveniences which are exerting pressure for modernization of the highway system, and in the light of current trends toward the accomplishment of higher standards to correct such deficiencies, it would be overly pessimistic to hold that the future will long obstruct a realization of the greater service possible in motor transport. The increasing application of highway planning and research, and the centering of attention upon the city as well as the rural problem, have already yielded signs of encouragement. Undoubtedly the highway system of the future will be based largely upon these two developments.

The provision of future highway service must quite naturally place greater emphasis upon the part which motor transport is to have in the whole transportation pattern. Inherently adapted to providing the speed and flexibility necessary for convenient short-run service, motor transport will be developed in the city through a replanning of the entire circulatory system, including parking and terminal areas; and in the country by a limited system of interregional highways, including freeways where traffic requires, designed with adequate rights-of-way properly protected from adjacent developments, and in connection with a more extensive land service network of low-cost all-weather roads.

In this future transportation pattern, with each transport agency performing the tasks for which it is best adapted, it is inconceivable that the railroads will continue to carry large volumes of less-than-carload shipments which the truck or plane is better suited to accommodate; and the provision of fast-freight service by rail and express service by air will accommodate many of the long hauls now moving by highway. Similarly, in the passenger field, the private and commercial plane can be expected to cut deeply into long-distance trips by automobile and bus. Having in mind the ultimate development of transportation in accordance with such considerations—a development toward which intelligent revision of transport policy must inevitably lead—the following are recommended as guides to future highway policy which will permit a realization of the inherent advantages of motor transportation:

1. Public action in the provision of highway facilities should be directed to the over-all requirements of the whole highway system, including rural and urban areas and primary, secondary, and local roads.
2. The expenditure of motor-vehicle revenues should be predicated on the principle that user charges should be spent where the needs of traffic dictate, in order to provide adequate facilities for those who pay the bill.
3. Of the vast highway mileage in the United States, many thousands of miles of little-traveled routes have no legitimate claim for improvement with public funds.
4. The relationship developed between the Federal and State Governments as a basis for grant-in-aid policy requires further extension in relations between the States and local road-building units, particularly in the expenditure of State-aid funds.
5. Consolidation and coordination of the vast number of highway administrative units must be accomplished in accordance with economic operating limits.
6. Because of the magnitude of highway needs in and around cities, a larger proportion of State and Federal highway funds should be spent in these areas.
7. The provision of parking facilities is a public responsibility, and public action should be taken to assure adequate off-street accommodations as a part of the urban highway plan.
8. Efforts to reduce the highway accident toll must give proper weight to all the variable: The driver, the pedestrian, the vehicle, and the highway; and there must be a coordinated set-up for safety administration, together with an overhauling of traffic-court procedure.
9. The immediate necessity for removing legal and financial obstacles to land acquisition calls for the establishment of a Federal land authority empowered to acquire and finance right-of-way for the States and local jurisdictions to repurchase on a time-payment basis.
10. Unsightly advertising and commercial developments using the roadside as a place of business should be regulated to restore to the highway and the community a respectable appearance, and to make possible the efficient service of which the highway and automotive engineer are capable.

PART II—SECTION III
2. THE MOTOR TRANSPORT INDUSTRY[1]

By C. S. Morgan, E. V. Breitenbach, and J. O. Riley[2]

This paper endeavors, in rather brief fashion, to indicate the structure and economic characteristics of the for-hire motor transport industry in its two major divisions, to appraise the industry from various viewpoints, and to set out some of the problems it faces and some of those it has created for other forms of transportation.

Development

Transportation of Property

The motor vehicle has proved to be a technological advance of prime importance. The motortruck, however, seemed to many in the earlier days of motorized vehicles to show much less promise than did the passenger car of becoming an agency of intercity or over-the-road transportation. Only 10,000 trucks were in service in 1910 and they rarely were found off city streets. By 1920, however, over a million were registered, and, though most were used in the urban field, a not inconsiderable number were dedicated to intercity and other over-the-road service. By that year, in fact, a new industry of great possibilities had embarked on its way. Its marked development resulted largely from the concurrent improvements of vehicles and roads and, more basically, from a latent demand for the kind of service the truck could render. Intercity trucking followed, however, in the wake of expanding intercity uses of the private car. The latter, far outnumbering the commercial vehicle, created an effective demand for road improvements and thereby brought about the provision of facilities which users of commercial vehicles could not have called into being had they stood alone.

The earliest over-the-road uses of trucks, other than those of farmers, commonly represented a reaching out of local cartage operators. The beginnings were inauspicious and seem likely to have gained substantial impetus only after a considerable lapse of time. The first World War intervened, however, and imposed so extraordinary a burden on existing transportation facilities that the truck was more or less forced to carry a share of the burden. An unusual opportunity for the industry to get under way, with the friendly beckoning of the railroads, was thus presented. Many present leaders of the industry then saw for the first time the possibilities of this new field of enterprise. The vehicles available were heavy, clumsy in design, and poorly sprung, with solid tires and inefficient power plants, and were costly to operate. By 1920 trailer combinations, soon to prove a great boon to the industry, had found only limited use in the city field. Nevertheless, with rail service seriously slowed down in vital spots and with rail rates at a high level, the truck of the World War period could and did give a limited but beneficial service to shippers. The spark was thus supplied; the industry needed no further prompting. It turned to manufacturers for better equipment and joined the passenger-car group in demanding further road improvements. Both were forthcoming, and the future seemed to offer abounding opportunities for the development of successful trucking enterprises.

Conditions materially changed, however, in the early twenties. The attitude of the railroads veered from one of general friendliness to one of general and increasing hostility. Business slumped in the latter half of 1920; after recovery in 1923, the demand for transportation service advanced at a slower pace than had been expected. Moreover, it was necessary that the motor-transport industry go through a period of largely uncontrolled development. Less capital was required to engage in trucking than to set up, say, a modest retail establishment. Shippers naturally welcomed this new type of service and many quickly realized how they could pit motor carriers against the railroads and against each other. Some shippers and some purveyors of equipment ruthlessly exploited an industry which had not yet found its feet. They invited many into the field who had no business there and who had no power to resist the impositions placed upon them. Operations commonly were conducted on a hand-to-mouth basis and with a short-sighted disregard of costs. The turn-over of operators was heavy and the losses, individually small, amounted to a large sum annually. State control of entrance into the interstate field was ineffective and was largely nullified by the *Kuykendall* decision in 1925 (267 U. S. 307). Oper-

[1] Because of space limitations, in many instances qualifying statements and explanatory and illustrative material have been omitted. The authors will be glad to supply these on request to interested students.

[2] Assistant Director; Chief, Section of Accounts; and Associate Economic Analyst, respectively, Bureau of Motor Carriers, Interstate Commerce Commission.

ations thereupon mushroomed further. Shippers were in the dark as to their competitors' rates or what their own rates would be a short time in the future; private motor transportation also grew and contributed to the difficulties in which rail, motor, and water carriers were enmeshed; the industry got more and more out of hand; motor rates often were depressed to uneconomic levels and rail rates were severely cut, particularly after the general business depression revealed the vulnerability of the rail position: and business standards suffered.[3]

These conditions of free play lasted about 15 years, or long enough to have enabled the public to determine the general aptitudes and problems of the industry and the need for its effective regulation in the public interest. A number of strong operators emerged in each section of the country. Reluctant for a long time but profiting by the experience gained under the National Industrial Recovery Act, and spurred on by the prospects of what conditions would be on the demise of that act, these operators accepted the inevitable and threw their active support to Federal regulation. Smaller carriers, generally less articulate, varyingly followed suit, were indifferent to or opposed to Federal regulation, or, as was true in the case of a great many very small operators, did not know such regulation was in the offing until or after it had been enacted. Many, in fact, had to be sought out some months after the legislation was passed in 1935 and urged by the Commission to protect the rights which the Act granted them.

The industry had only partially grown up by 1935; it lacked various of the marks of maturity presently noted in the case of carriers of passengers. Its dynamic growth had made it a substantial but unruly member of the transportation family. It had disappointed the railroads, which then looked upon it, as many still do, as inherently a short-haul and feeder type of transportation. Instead, it had developed, under a free hand, in deadly competition with rail and some branches of water transportation. Though it spread its services out over the byways, it developed most extensively where the major flows of traffic occurred and therefore over routes which parallel the rail lines and often short-cut the water lines. Long before 1935 it had become a national problem.

The impossibility of measuring the growth of the industry is clear from the foregoing. The beginnings were so humble, the growth after the War period was so fast, operators were preponderantly small, and came and went with such frequency that adequate record-keeping and statistical reports could not have been expected. The number of carriers in the various post-war years and their aggregate annual revenues probably will always remain beyond reliable estimate. However, it is possible to make reasonable acceptable guesses as to the trend in the aggregate volume of service rendered in the last 15 years. A set of estimates of this kind is given below.[4]

Year	Ton-miles	Percent increase	
		Over 1926	Over preceding figure
	Billions		
1926	27.7		
1932	32.4	17	17
1937	42.6	54	31
1940	48.5	75	14

These estimates are intended to exclude transportation on trips of 25 miles or less. They cover both private and for-hire transportation.[5] In the greater part, if not all, of the period shown an approximately equal division between the two branches may be assumed, though far fewer for-hire than private vehicles are required to furnish a given number of ton-miles of service.[6]

Transportation of Passengers

Carriers of passengers in the intercity field went through a process of development which in some respects necessarily differed from that of carriers of property. Here also the beginnings before the World War were small and in the "byways." Equipment was crude and reliable and comfortable service could not be rendered over any great distance. The rise in rail travel in the World War period to an all-time peak provided a definite stimulus to the bus industry, though a lesser one than that provided by the importunities of shippers and railroads in the case of property transportation. Also, the field for development after the War was somewhat less open or free, owing to the larger capital required to enter the business and to the responsibility felt by the majority of operators for the maintenance of reliable service. This responsibility to the traveling public also found expression in numerous State acts and administrative rulings in respect

[3] See Federal Coordinator of Transportation, *Regulation of Transportation Agencies*, Senate Doc. No. 152, 73d Cong., 2d sess., pp. 1–2, 13–15.

[4] Based on estimate for 1940 in 55th Annual Report of the Interstate Commerce Commission, adjusted for total truck registrations in the other years shown. The method employed somewhat overstates the importance of truck transportation in the early years and to that extent understates the percentage increase over 1926.

[5] The distinction between the two, none too clear at present, was even less clear in the period prior to Federal regulation.

[6] See Interstate Commerce Commission, *Federal Regulation of the Sizes and Weight of Motor Vehicles*, House Doc. No. 354, 77th Cong., 1st sess., pp. 91–97, 113–115, for explanation in terms of the larger size and greater annual mileage of for-hire vehicles.

of the provision of insurance, the observance of safety standards, and the maintenance of schedules. These controls were not seriously affected by the *Kuykendall* decision of 1925. Organized user pressure was lacking for the most part and railroad hostility was less marked than in the truck field, though bus operations soon found their way to routes which connected the larger cities, in direct competition with the railroads.

A race for operating rights began and reached a faster and faster pace, set by a few strong operators who could foresee the possibilities of the industry. The carriers who lacked the ability or desire to expand soon fell behind in the face of the competition of carriers whose operations paralleled their own and reached out beyond to distant places. Competition got severely out of hand, but the condition was not chronic. Thus, travelers could "shop around" for bargains in fares and were abetted by last-minute efforts to "make a load"; going rates in some cases were driven to ruinous levels for short periods; "fighting lines" were used by some strong operators to drive out newcomers who held out a less desirable service at lower fares. The public suffered to some extent from the irresponsibility of operators who lacked capital, were ignorant of the problems involved in the conduct of a sound enterprise, or looked to short-run profits and cared little or nothing for their obligations to the public. Such operators lost out in time, and conditions generally showed definite signs of improvement several years before Federal regulation was undertaken.

In other words, the bus industry "grew up" more rapidly than did intercity trucking. It was natural that such should have been the case, as the industry was recognized at an early date as having some of the characteristics of a "natural monopoly." It served and was required to serve all who came, in contrast to the individualized services of many carriers of property, and its operations were of a kind in which sheer size and reach spell special benefits to the users of the service. An extensive radius of operations, unification of carriers, financing with capital beyond that supplied by the operators, adequate responsibility to patrons, more effective cooperation between the carriers, recognition of the need for Federal regulation, and other evidences of maturity came at a fairly early date in this industry. Its field of service, though shown by recent developments not to be immutable, is not the subject of a basic controversy such as exists in the property-carrying field.

As a result of the conditions noted above, of the absence of complex differences in the legal status of the carriers, of the relatively small number of carriers, and of the ability of trade journals to keep up with developments, a somewhat more satisfactory statistical record going back over 15 years is available. Essential parts of this record are briefly set out below:[7]

Year	Number of carriers	Number of busses in use	Busses per carrier	Miles of bus route	Miles of route per carrier	Bus-miles
1925	6,200	23,000	3.7	200,000	32	920,000,000
1928	7,700	30,000	3.9	280,000	36	1,320,000,000
1932	3,900	26,500	6.8	365,000	94	1,120,000,000
1935	3,500	23,500	6.7	345,000	99	1,100,000,000
1939	2,598	18,614	7.2	331,000	127	853,000,000
1940	2,308	18,000	7.8	315,000	136	884,000,000

The decline in the number of carriers since 1928 is indicative mainly of the process of unification and of the dropping out of smaller carriers, but the decline in the number of busses and bus-miles reflects in large part an increase in the seating capacity and in the effectiveness of the utilization of equipment. Changes in miles of bus route reflect expansion and abandonment of operations and unifications of duplicated services. Data on the number of passengers carried, while available, are not sufficiently accurate for indicating trends in business volume. Recently, and especially within the last year, the number of intercity passengers has increased. Relative to the total business, long-haul passenger travel by bus is becoming somewhat less important.

General Comments

The intercity trucking industry entered the period of Federal regulation with many more problems and yet more reluctantly than did the bus industry. Conditions inherent in bus transportation and the greater effectiveness of State regulation brought about a substantial degree of indirect control of entrance into interstate service and of demarcation of the spheres of influence of individual carriers, and the making of rates could then, as now, be left very largely to the carriers themselves. External and internal pressures existed, but they were far less important than the shipper, railroad, and internal pressures that were being felt by the trucking industry. The latter, as the result of its uncontrolled development, faced the Herculean task of working out satisfactory rate structures and of straightening out badly entangled and often vague and uncertain operating rights, as well as a large number of related but lesser tasks. Five or six years of Federal regulation, aided in some cases by more effective State regulation, have accomplished

[7] Adapted from table 3 of Federal Coordinator of Transportation, *Hours, Wages, and Working Conditions in the Intercity Motor Transport Industries*, 1936, part I, with addition of data for 1939 and 1940. The amounts shown are from data in *Bus Transportation* and *Bus Facts*. The possibility of there being some errors is noted in the Coordinator's report.

much in these directions. Natural differences in the characteristics of the various members of the trucking industry continue, of course, though clarification of what these differences are still is far from complete. Intercity carriers of property, in the view of some, are attempting to function in fields beyond those indicated by their natural aptitudes. The industry, still dynamic, as a whole resists any efforts to circumscribe its field of operations, though in varying degrees it indicates a willingness to "coordinate" its services with those of the railroads. The problem of determining and implementing the aptitudes of motor transportation of property, and the other problems noted above have their genesis, in part, in the way in which the motor carrier industry developed.

Economic Structure

The discussion to this point has embraced in a general way all classes of for-hire motor transportation. It now becomes necessary to confine the coverage for the most part to carriers subject to the general jurisdiction of the Commission.[8] This need arises mainly from lack of data.[9] In the interest of brevity and in view of the removal of many local carriers from Federal regulation as motor carriers,[10] the ensuing discussion is further confined for the most part to carriers engaged predominantly in intercity or over-the-road service.[11]

The term "economic structure" refers to the make-up of the motor transport industry (number, sizes, and kinds of carriers and the classes of service rendered) and to the economic interests represented in the industry.

[8] That is, to control of entrance into service and of rates and related matters, in addition to safety regulations.

[9] The omitted groups include "exempt" and certain "local" interstate for-hire carriers, subject to regulation only in respect of safety and maximum bases of service (section 203 (b) of Interstate Commerce Act), and intrastate for-hire carriers. Unquestionably, there are many thousands of motor carriers of property, preponderantly small in size, engaged only in intrastate transportation; i. e., within the borders of a single state without connection with transportation to or from points outside the state. The amount of intrastate transportation, including that performed by interstate carriers, undoubtedly is a very substantial part of all over-the-road transportation. In addition, legislation enacted in 1940 removed from regulation as motor carriers those carriers which perform transfer collection, and delivery service for common carriers subject to regulation as a railroad, an express company, a motor carrier, or a water carrier (section 202 (c) (2)). This legislation also provided for the conditional exemption of carriers operating within a single state whose interstate transportation is found not to require regulation under the Interstate Commerce Act (section 204 (4a)). Many carriers have been eliminated under the first provision, but few have applied for exemption under the second. In the case of bus operations, carriers "exempt" under section 203 (b) are less important than in the property field, wholly intrastate operations are of very minor importance, except in the suburban field, and there is relatively little local service subject to the provision of section 202 (c) (2).

[10] See preceding footnote.

[11] For purposes of convenient reference, local carriers are left in tables 1 and 4, and there is incidental mention of them from time to time.

Carriers of Property

As of December 31, 1939, there were 26,167 carriers of property of record subject to the general jurisdiction of the Commission,[12] of which 21,424, or 81.9 percent, were engaged predominantly in intercity service and 4,743, or 18.1 percent, predominantly in local service.

Distribution of Carriers by Size

Motor transportation of property has been and still is conducted to a very large extent by small carriers. Table 1 shows that carriers with 1 power unit (truck or tractor) or 2 such units represented 54.6 percent of the intercity carriers in 1939, but accounted for only 14.5 percent of the power units and 8.6 percent of the revenues. Class II and Class III carriers constituted 95.5 percent of the intercity carriers, but accounted for only 61.7 percent of the vehicles and 45.1 percent of the revenues. The average revenue per Class I carrier was 106 times greater than the average revenue of one-truck operators. The largest carrier had revenues of $6,589,362 in 1939; 59 carriers had revenues in excess of $1,000,000. The smaller carriers necessarily operate over shorter distances as a rule, and generally use smaller vehicles.

Distribution of Carriers by Class of Operation

Table 2 indicates that carriers engaged predominantly in transporting general commodities constituted 33 percent of all intercity carriers of record subject to the Commission's general jurisdiction in 1939, operated about 52 percent of the power units, performed a like percentage of the total vehicle-miles, carried 49 percent of the total tonnage, and accounted for slightly less than 60 percent of the total revenue. Special commodity carriers accounted, of course, for complementary percentages of the respective totals.[13]

Predominantly regular route carriers, although only 31.6 percent of the number of carriers, accounted for 49.7 percent of the vehicle miles and 56.8 percent of the total revenues.

[12] Prior to removal of carriers under section 202 (c) (2); see footnote 9.

Unless otherwise indicated, data given in this section are from the annual reports of Class I motor carriers for 1939 and from brief voluntary reports made by Class II and Class III carriers, supplemented by estimates. The latter reports are not based on a prescribed system of accounts and, individually, doubtless contain many errors.

The three classes have average annual gross revenues, respectively, of $100,000 or more, $25,000 up to $100,000, and less than $25,000. This grouping is, of course, somewhat arbitrary in character.

[13] The classification follows, so far as it goes, the more detailed classification adopted in 1937 (2 M. C. C. 703), and reflects the predominant operation of each carrier. The distribution presented may not agree in all cases with that at present. Such is particularly true of contract carriers (see footnote 14), which are relatively less important at the present time than is indicated in the table.

TABLE 1.—*Classification of Motor Carriers of Property of Record Subject to the General Jurisdiction of the Interstate Commerce Commission by Number of Power Units and Revenue, Year Ended Dec. 31, 1939*

Class of carrier	Power units per carrier	Carriers		Total power units		Revenues		
		Number	Percent of total	Number	Percent of total	Amount	Percent of total	Per carrier
PREDOMINANTLY INTERCITY								
Class II or III	1	7,300	34.1	7,300	6.6	$27,150,554	3.9	$3,719
	2	4,382	20.5	8,764	7.9	32,981,385	4.7	7,526
	3	2,649	12.4	7,947	7.1	32,734,592	4.7	12,357
	4	1,687	7.8	6,748	6.1	31,111,085	4.5	18,440
	5	1,157	5.4	5,785	5.2	27,348,221	3.9	23,635
	6–10	2,378	11.1	17,646	15.8	93,902,731	13.4	39,488
	11–15	565	2.6	7,120	6.4	37,457,370	5.4	66,296
	Over 15	334	1.6	7,388	6.6	32,142,451	4.6	96,229
Total		20,452	95.5	68,698	61.7	314,828,389	45 1	15,393
Class I		972	4.5	[1] 42,599	38.3	383,237,146	54.9	394,279
Total		21,424	100.0	111,297	100.0	698,065,535	100.0	32,584
PREDOMINANTLY LOCAL [2]								
Class II or III	1	1,844	38.9	1,844	7.5	5,288,535	5.6	2,867
	2	861	18.1	1,722	7.0	4,913,280	5.2	5.706
	3	550	11.6	1,650	6.7	5,311,320	5.6	9,654
	4	373	7.8	1,492	6.0	4,578,516	4.9	12,272
	5	246	5.2	1,230	5.6	3,851,407	4.1	15,655
	6–10	472	10.0	3,528	14.5	11,995,355	12.8	25,414
	11–15	113	2.4	1,427	5.8	5,418,840	5.8	47,954
	Over 15	146	3.1	3,362	13.8	10,933,627	11.6	75,574
Total		4,605	97.1	16,255	66.9	52,290,880	55.6	11,355
Class I		138	2.9	8,036	33.1	41,818,340	44.4	303,031
Total		4,743	100.0	24,291	100.0	94,109,220	100.0	19,842

[1] Includes 10,074 vehicles used principally or exclusively in local service, almost entirely of the nature of pickup and delivery incident to line-haul operations of same carriers.
[2] See footnote 9 for reduction in number of such carriers under 1940 legislation.

Contract carrier operations are necessarily of minor importance in the transportation of general commodities. Special commodities preponderantly move over irregular routes.

The distribution between common and contract carriers generally is relatively constant for all measures given and is about 83 and 17 percent, respectively. However, common carriers accounted for about 76 percent of the tons transported and contract carriers for about 24 percent.[14]

Differences in the size and type of equipment used, in average lengths of haul, and in frequency of operation must be considered in analyzing the distribution of power units, vehicle-miles and tons transported shown in Table 2. Thus, contract carriers are shown to have accounted for 16.8 percent of the power units and for 17.9 percent of the vehicle-miles, but to have transported 23.7 percent of the tonnage. Their average haul, however, may be less and their vehicles generally are larger.[15] The relations here indicated and others which the table suggests would be greatly illuminated if ton-mile data were available.

Regular-route operations, conducted by less than a third of the carriers, accounted for nearly half of the power units, vehicle-miles and tonnage, and for nearly 57 percent of the revenues. Irregular-route operations appear to be conducted on the basis of heavier loads of commodities on which lower rates are paid than on those transported in regular-route operations.

The relatively better showing in respect of revenues than of tons transported in the case of general commodity, regular route, and common carrier operations results from the marked disparity between the showing as to tons transported and revenues in the case of common carriers carrying general commodities over regular routes. This disparity arises principally from

[14] It should be noted, however, that there has been a rather marked transformation of operations originally classed as contract carrier into common carrier operations since the date of Federal regulation, some of which has occurred subsequent to the date of the material presented above. The reason lies largely in the fact that in 1935 and later many carriers who considered themselves contract operators were found, on determination of their status under the act, to be common carriers. There also have been numerous voluntary transformations because of difficulties in meeting contract filing requirements and for other reasons. Similarly, irregular route operations have drifted into regular route, though generally without proper official recognition of the transformation. The data in Table 2 therefore overstate the importance of these two types of operation.

[15] A very small sample of Class I contract carriers had an average haul of 240 miles in 1938, compared with 228 miles for a sample of Class I common carriers. Average loads, allowing for partial loading of vehicles and empty mileage, were 6.4 and 5.9 tons, respectively. Average revenue per ton was $2.19 in the case of contract carriers, compared with $3.41 in the case of common carriers. (Interstate Commerce Commission, Bureau of Statistics, *Statistics of Class I Motor Carriers, 1938*, p. 31.) The average haul shown is probably overstated for the general run of Class I contract carriers. It is also to be noted that local pick-up and delivery equipment of intercity carriers is less important in the contract than in the common carrier field and that such equipment is included in the total power units shown in Table 2, whereas the mileage traveled is not included.

TABLE 2.—*Classifications of Predominantly Intercity Carriers of Property of Record Subject to the General Jurisdiction of the Interstate Commerce Commission, Dec. 31, 1939* [1]

Class of operation	Number of carriers	Percent of total				
		Carriers	Power units	Vehicle-miles in intercity service	Tons transported	Revenues
General commodities:						
Regular route—						
Common	4,810	22.5	40.3	42.5	37.6	50.6
Contract	63	.3	.9	.8	.9	.9
Total	4,873	22.8	41.2	43.3	38.5	51.5
Irregular route—						
Common	2,084	9.7	9.2	7.6	9.1	7.1
Contract	111	.5	1.2	1.0	1.4	1.2
Total	2,195	10.2	10.4	8.6	10.5	8.3
Total, general commodities	7,068	33.0	51.7	51.9	49.0	59.8
Special commodities:						
Regular route—						
Common	1,221	5.7	3.2	3.3	3.1	2.7
Contract	660	3.1	2.5	3.1	4.1	2.6
Total	1,881	8.8	5.7	6.4	7.2	5.3
Irregular route—						
Common	9,731	45.4	30.5	28.7	26.5	23.4
Contract	2,744	12.8	12.2	13.0	17.3	11.5
Total	12,475	58.2	42.7	41.7	43.8	34.9
Total, special commodities	14,356	67.0	48.4	48.1	51.0	40.2
Grand total	21,424	100.0	100.0	100.0	100.0	100.0
Total, regular route	6,754	31.6	46.9	49.7	45.7	56.8
Total, irregular route	14,670	68.4	53.1	50.3	54.3	43.2
Total	21,424	100.0	100.0	100.0	100.0	100.0
Total, common	17,846	83.3	83.2	82.1	76.3	83.8
Total, contract	3,578	16.7	16.8	17.9	23.7	16.2
Total	21,424	100.0	100.0	100.0	100.0	100.0

[1] Data from appendix table A. See 2 M. C. C. 703 for definitions of classes and footnote 14 for qualification of classification.

the generally much smaller shipments and greater service performed in the case of this type of operation than in others. There also may be differences in average length of haul and other factors. If these differences exist, they are not capable of demonstration with the data available.

The disparity between the percentage distribution of number of carriers and the other measures shown in Table 2 results largely from variations in the class of operation with size of carrier.[16] On the whole, it would appear that the smaller carriers are engaged to a much greater extent than are the larger carriers in transporting special commodities and possibly also in regular route operations. Thus, only 26.9 percent of the carriers operating 1 power unit were engaged in transporting general commodities, while the relative importance of carriers so engaged increased fairly steadily with size of carrier to 70.9 percent for the Class I carriers (average number of power units per carrier=43.8). Also, the range in the percentage importance of regular-route operations is almost as great as between the 1 power unit operators (30.3 percent) and Class I carriers (68.6 percent). However, there was little or no change in the case of the intermediate groups.[17]

[16] These relations are indicated in Table A, wherein information similar to that in Table 2 is presented by size of company.

Economic Interests Represented in the Industry

Proprietorship.—Of the 21,424 intercity carriers of property of record subject to the general jurisdiction of the Commission in 1939, about 17.3 percent were incorporated enterprises, 12.4 percent partnerships, and 70.3 percent single proprietorships.[18] Size of carrier, of course, dictates capital requirements and to a considerable extent the form of business organization. See Table 3.

Single proprietorships accounted, however, for less than 40 percent of the vehicle-miles, for less than 38 percent of the tons transported, and for less than 34 percent of the revenues of carriers engaged predominantly in intercity service. On the other hand, corporations represented only 17.3 percent of the total number of carriers, but accounted for more than 49 percent

TABLE 3.—*Percentage Distribution, by Type of Ownership and Size, of Predominantly Intercity Carriers of Property of Record Subject to the General Jurisdiction of the Interstate Commerce Commission, 1939*

Size of company (number of power units)	Number of carriers	Type of ownership—percent of total companies			
		Individual	Partnership	Corporation	Total
Class II and III carriers:					
1	7,300	88.2	8.2	3.6	100.0
2	4,382	78.2	13.4	8.4	100.0
3	2,649	68.2	16.7	15.1	100.0
4	1,687	61.5	18.3	20.2	100.0
5	1,157	60.1	15.2	24.7	100.0
6–10	2,378	49.0	15.8	35.2	100.0
11–15	565	36.6	13.0	50.4	100.0
Over 15	334	35.6	10.6	53.8	100.0
Total class II and III	20,452	72.8	12.7	14.5	100.0
Class I (average power units per carrier=43.8)	972	15.6	6.4	78.0	100.0
Grand total	21,424	70.3	12.4	17.3	100.0

[17] Local carriers are engaged in transporting general commodities to a much greater extent, relatively, than are intercity carriers. On the basis of number of carriers and tons, the relative importance of common and contract carrier operations is not greatly different from that found in the intercity field. However, in terms of power units and revenue, contract operations are somewhat more important than they are in intercity operations, owing largely to the fact that the average size of contract carriers in local service is greater than that of common carriers similarly engaged. No data are available to indicate the reason for their greater importance in terms of revenues. However, it is to be noted that the relative importance of tons transported and revenue is reversed from what is found in intercity service for both general and special commodities and common and contract type of operations. In the local field, general commodities account for a relatively greater proportion of tonnage than of revenue, or the reverse of the situation found in the intercity field. Likewise, local contract operations account for a greater proportion of revenue than of tons transported.

[18] Other forms of ownership were reported by 35 carriers. Incorporated enterprises represented 3.6 percent of the total of 1-unit operators, but many of these small corporations appear to be of a rather nominal character.

of the vehicle-miles, for more than 52 percent of the tons transported, and for more than 56 percent of the revenues.[19]

The relative contributions of capital represented by the several types of ownership cannot be stated for the industry as a whole with the information immediately available. The following data with respect to Class I carriers as of December 31, 1939, are of interest, however.

Number of carriers	Equity interests		
	Capital stock and surplus [1]	Sole proprietorship	Partnership
957	$56,670,881	$7,057,832	$4,324,042

Number of carriers	Creditors		
	Equipment notes	Bonds and other long-term obligations	Advances [2]
957	$11,642,497	$6,596,579	$8,214,259

[1] Includes earned and unearned surplus in the amount of $19,810,571. A very minor part of this total is assignable to sole proprietorships and partnerships.
[2] This item in some cases may be closely akin to an equity interest.

The capital stock of property carriers is, with very few exceptions, rather closely held. Generally speaking, the corporations are family affairs and ownership is held by members of single families. Even in the exceptional cases the stock is owned by only a few interests, so that there is no public ownership in the sense of a wide public distribution. The amount shown under capital stock includes both common and preferred stock. The percentage of preferred to the total, however, is negligible.

The number of holding companies controlling motor carriers is very limited; in a few instances, railroads use such companies in holding the securities of motor-carrier subsidiaries or of motor carriers in which they have an interest.

Management.—Owing to the character of ownership of motor-carrier properties, noted above, no management interest as such exists in the case of much the greater number of carriers. It may be noted, however, that 1,849 persons, or a little over 2 percent of the employees of Class I carriers in 1939, were classified as general officers. The average compensation of 1,217 such officers in the employ of 634 carriers was $6,580. This figure indicates that substantial amounts recorded as salaries are in reality a division of profits. The practice of paying "bonuses" to officers and thus augmenting expenses and reducing net income, is possible largely because of the close ownership of even the largest carriers. Small carriers, owned and managed by the same person or persons, tend to ignore the difference between the compensation for ordinary labor service, for management, and for return on capital investment or "profit."

Employees.—The only reliable data on volume of employment available at this time are those for Class I carriers. The average number of employees of such carriers during 1939, by classes, is given below. So-called "owner-operators" and their employees are not included.

Number and Classification of Employees of Class I, Intercity Motor Carriers of Property, 1939

	Number	Percent
Classification:		
Equipment, maintenance, and garage:		
Supervisory employees	640	0.7
Others	5,855	6.4
Total	6,495	7.1
Transportation:		
Supervisory employees	1,859	2.0
Drivers and helpers	41,294	45.3
Others	135	.2
Total	43,288	47.5
Terminal employees	27,575	30.2
Sales, tariff and advertising employees	3,534	3.9
Insurance and safety employees	248	.3
Administration and general:		
General officers	1,849	2.0
Others	8,224	9.0
Total	10,073	11.0
Grand total	91,213	100.0

From the data given above and certain other information, it is estimated that the average number of employees during 1939 of all carriers of property subject to the general jurisdiction of the Commission was 180,000. This estimate does not include owner-operators (persons who lease equipment to carriers and sometimes drive it themselves) or their employees. Such operators and their employees are, however, generally carried as employees on the books of the lessee carrier. These owners and drivers of equipment have a substantial interest in the welfare of the motor carrier industry.

Carriers of Passengers

The economic structure of this branch of motor transportation differs materially from that of carriers of property. Passenger transportation is inherently a simpler form of transportation and has matured to a higher degree than its counterpart in the property field. Furthermore, the statistical data now available are more adequate.

[19] The situation in the local field in 1939 was as follows: Individual proprietorships, 71.0 percent; partnerships, 11.4 percent; and corporations, 17.6 percent of the total number of enterprises.

Distribution by Class of Operation [20]

As of December 31, 1939, there were 1,554 such carriers as follows:

Common—intercity	857
Contract—intercity	—
Common, charter or special—intercity	365
Common—local or suburban	332
Total	1,554

The classification above is based upon the predominant type of operation which each carrier conducts. Thus, the great majority of carriers in the intercity and local common carrier, regular route groups engage in charter operations. Carriers in the "charter or special" group, however, may not engage in regular-route operations of the type conducted by the first group, but furnish point-to-point service, often tied in with the furnishing of such special services as the arrangement for hotel rooms or the provision of guides. The "local or suburban" carriers are those which engage in serving what is generally known as "border traffic." [21]

TABLE 4.—*Classification of Motor Carriers of Passengers Subject to the General Jurisdiction of the Interstate Commerce Commission by Number of Vehicles and Revenue, Year Ended Dec. 31, 1939*

INTERCITY

Class of carrier	Passenger vehicles per carrier	Carriers		Total passenger vehicles		Revenues		
		Number	Percent of total	Number	Percent of total	Amount	Percent of total	Per carrier
Class II or III	1	258	21.2	258	2.1	1,096,493	0.7	$4,250
	2	196	16.1	392	3.2	1,598,803	1.1	8,153
	3	153	12.5	459	3.8	2,009,092	1.4	13,131
	4	115	9.4	460	3.8	2,265,900	1.6	19,704
	5	74	6.1	370	3.0	1,532,743	1.1	20,700
	6–10	202	16.5	1,487	12.2	7,980,912	5.6	39,508
	11–15	44	3.6	569	4.7	3,077,743	2.2	69,949
	Over 15	25	2.0	601	4.9	2,584,616	1.8	103,385
Total		1,067	87.4	4,596	37.7	22,146,302	15.5	20,756
Class I		155	12.6	7,615	62.3	120,548,445	84.5	777,087
Total		1,222	100.0	12,211	100.0	142,694,747	100.0	116,771

LOCAL

Class of carrier	Passenger vehicles per carrier	Carriers		Total passenger vehicles		Revenues		
		Number	Percent of total	Number	Percent of total	Amount	Percent of total	Per carrier
Class II or III	1	147	44.3	147	3.6	1,328,300	5.0	9,716
	2	26	7.8	52	1.3	412,333	1.6	15,859
	3	27	8.1	81	2.0	255,222	1.0	9,456
	4	16	4.8	64	1.6	233,889	.9	14,618
	5	18	5.4	90	2.2	456,800	1.7	25,378
	6–10	36	10.8	262	6.5	1,272,758	4.8	35,354
	11–15	3	0.9	41	1.0	252,517	1.0	84,172
	Over 15	9	2.8	268	6.6	1,042,138	3.9	115,793
Total		282	84.9	1,005	24.8	5,253,957	19.9	18,631
Class I		50	15.1	3,043	75.2	21,191,516	80.1	423,830
Total		332	100.0	4,048	100.0	26,445,473	100.0	79,655

[20] For statistical purposes, carriers are classified as "local or suburban" if their average fare per passenger does not exceed 20 cents.

[21] No intercity contract carriers of passengers are shown in the summary above. Only about four contract carrier permits have been granted and all except one or two of these have been vacated.

A few industrial plants and stores use busses on a contract basis, but these uses appear to be almost wholly intrastate and local in character. Direct private operations of busses is necessarily very limited. The carriage of baggage is a part of all passenger operations; regular-route carriers may carry mail without specific authorization by the Commission; authority to carry newspapers and express must, however, be obtained by specific grant.

Distribution of Carriers by Size

The much greater degree of concentration of the passenger than of the freight business is indicated by Table 4. Thus, 155 Class I intercity carriers, or 12.6 percent of the total number, operated 62.3 percent of the busses and earned 84.5 percent of the revenues. The 12 largest carriers accounted for 42.2 percent of the revenues of all intercity carriers.

Economic Interests Represented in the Industry

Proprietorship.—Of 1,222 intercity and local carriers in 1939, 50.5 percent were incorporated enterprises, 7.8 percent, partnerships, and 41.7 percent sole proprietorships. The individually owned enterprises as a rule are of smaller size and operate smaller equipment.

The relative amounts of capital represented by the several types of ownership cannot be stated for the industry as a whole. Information as to the sources of the capital of Class I carriers is set out below:

Class of carrier	Number of carriers	Equity	
		Capital stock and surplus	Sole proprietorship [1]
Intercity	145	[3] $97,891,519	$178,654
Local	42	[4] 36,676,619	55,172
Total	187	134,568,138	233,826

Class of carrier	Number of carriers	Creditors		
		Equipment notes	Bonds and other long-term obligations	Advances [2]
Intercity	145	$9,027,961	$1,916,233	$14,873,530
Local	42	3,038,053	46,712,794	480,657
Total	187	12,066,014	48,629,027	15,354,187

[1] A very minor part of the surplus shown under "capital stock" may be assignable to sole proprietorships.
[2] This item in some cases may be closely akin to an equity interest.
[3] Earned and unearned surplus, $32,904,413.
[4] Surplus deficit, $1,410,144.

The number of sole proprietorships among Class I carriers is, of course, small, and there are no partnerships. The difference between intercity and local carriers in the use of bonds and other long-term obligations is noteworthy. The much larger use of advances by intercity carriers is a reflection of the intercorporate affiliations which exist in this branch of the industry. As distinguished from control over carriers of property, there is one holding company which controls a substantial portion of the passenger-carrying industry. The capital stock of the holding company in turn is held by over 14,000 individual stockholders. Railroads also hold a

substantial portion of the capital stock of some of the underlying companies in this group. The capital stock of a number of the larger passenger carriers, outside of this group, is held by other railroads, either individually or jointly.

Management.—There is more opportunity here than in the case of property carriers for a distinct management group to develop. Class I intercity motor carriers had 311 general officers in 1939, equivalent to 1.5 percent of their total employees. The average compensation was $6,863, or approximately the same as that of the general officers of Class I carriers of property. As in the case of property carriers, small carriers, owned and managed by the same person or persons, tend to ignore the difference between compensation for ordinary labor services, for management, and for return on capital investment or "profit."

Employees.—The only reliable data available at this time are those for Class I carriers. The average number of employees by classes in 1939 is shown in the accompanying tabulation.[22]

Number and Classification of Employees of Class I, Intercity Motor Carriers of Passengers, 1939

	Passenger	Percent
Classification:		
Equipment, maintenance and garage:		
Supervisory employees	303	1.5
Others	4,098	20.3
Total	4,401	21.8
Transportation:		
Supervisory employees	538	2.6
Drivers and helpers	9,206	45.5
Others	377	1.9
Total	10,121	50.0
Terminal employees	3,182	15.7
Sales, tariff and advertising employees	369	1.9
Insurance and safety employees	56	.3
Administration and general:		
General officers	311	1.5
Others	1,790	8.8
Total	2,101	10.3
Grand total	20,230	100.0

A survey conducted by the Commission in March 1941, for the Wage and Hour Division of the Department of Labor developed information for 22,992 employees of 765 reporting interstate line-haul carriers, or an average of 30 employees per carrier, as compared with an average of 136 for the carriers above. It is impossible, with data readily at hand, to determine accurately the number of employees of all passenger carriers subject to the general jurisdiction of the Commission. However, from the data in the tabulation above and other information, it is estimated that the number during 1939 was slightly less than 33,000, including approximately 6,000 employees of local and suburban carriers.

Conclusion

The material offered in this section serves to indicate the effects of differences in the course and stage of development of the two branches of the motor transport industry and, more basically, of inherent differences in the nature of the two branches. Heterogeneity as to size of carrier, type of service and degree of regulation, and individualism in management characterize the property branch. The future course of development of this branch is less clearly discernible than that of the much more standardized passenger branch. It may be assumed that some elements of this heterogeneity will disappear, along with some of the plethora of services so frequently found at present. Other elements, reflecting as they do functional differences,[23] will continue, in the absence of adverse factors, and it is to the public advantage that they do so.

Economic Position of the Motor Carrier Industry

An objective appraisal of the economic position of an industry involves, basically, consideration of its present and likely future earning power and, more specifically, of trends in the quantity and quality of its output, in the selling price of its product or service, and in the well-being of those who supply the capital, the management, and the labor which go to make it up. It also requires analysis, as phases of each of the foregoing, of the industry's short- and long-run problems, including those which involve its relations to its competitors.[24]

Carriers of Property

The fact that intercity motor transportation of property has expanded greatly and that rail and certain branches of water transportation have retreated, both relatively and absolutely, is a familiar one. Factors other than motor competition necessarily enter into these trends.[25] There can be no doubt, obviously, of the extensive losses to trucks and of the many and deep reductions made in rail rates to meet motor competition. These losses are accounted for in very large part by the superior service the trucks can render on many

[22] Class I carriers engaged preponderantly in local or suburban operations had an average of 4,447 employees during 1939. The distribution of employees is substantially the same as that given above.

[23] Thus the small carrier plays to a large extent the role of a feeder or carrier in the byways, as will become more clearly apparent if the survey suggested in a later section is made. His smallness in these instances is a reflection of the job he has to do.

[24] The ensuing analysis is necessarily, however, of limited scope. Also, it does not for the most part bring in the unusual developments incident to the defense program.

[25] See, for example, Interstate Commerce Commission, Bureau of Statistics, *Fluctuations in Railway Freight Traffic Compared with Production, Class I Steam Railways, 1928–1940*, September 1941.

hauls and classes of traffic. Aside from the factor of street and highway congestion, the quality of truck service has continued to improve. Better vehicles, better roads, new roads which shorten distances, and better operating methods supply the explanation in large part.

The general downward trend of motor rates characteristic of the period before 1935 continued after Federal regulation was undertaken and still continues, though to a lesser degree.[26] The level of rates in certain large territories was raised slightly through the blanket minimum rate orders of the Commission[27] and has been held at that point, except for piecemeal and generally downward changes subsequently allowed in the numerous supplemental orders of the Commission, and for a few increases made without formal Commission action.

Data as to average ton-mile revenues, available for a small sample of Class I common carriers, follows:

District	Number of carriers		Revenue per ton-mile (cents)	
	1938	1939	1938	1939
Eastern	15	11	3.37	3.84
Southern	2	5	3.49	3.66
Western	25	25	3.43	4.05
Total	42	41	3.41	3.88

The average for a still smaller sample of contract carriers was 2.19 cents in 1938. A comparison with rail averages of about 0.994 cent in 1938 and 0.983 cent in 1939 would be misleading without allowance for differences in the character of the traffic and the lengths of haul of the two forms of transportation. By and large, however, these averages differ little from those for rail service under comparable conditions. Considering the superiority of motor service in many respects, this approximate similarity of charges is a source of great advantage to shippers and a basic factor in the continued expansion of motor transport service.

An industry may expand and furnish a service or product which the public will buy in increasing amounts and still not be functioning as healthfully as it should. An analysis of the financial condition of the carriers is therefore necessary. This analysis is necessarily limited in scope.

The operating ratio, or the percent of operating revenues absorbed by operating expenses and operating taxes, is of some significance in this connection. In the railroad field a ratio of about 75 percent is considered favorable. Owing to the relatively small investment of motor carriers in fixed property or, stated otherwise, to the large extent to which they pay for the use of such property through day-to-day charges to operating expenses in the form of taxes, an average ratio comparable to that of the railroads is out of the question. What remains after paying operating expenses and taxes, assuming proper charges to expenses for supervisory and other managerial services performed by the owners of the carriers, and omitting income from nonoperating sources, is available for the payment of income taxes and interest on obligations, and for return on investment or "profit." Interest charges of Class I intercity motor carriers represent, however, less than one-half of one percent of operating revenues, whereas those of the railroads have absorbed considerably over 10 percent in recent years. Other "fixed charges" of motor carriers are also less. A ratio of 90 percent is sometimes used as a measure of financial well-being for such carriers, though clearly any single ratio has its limitations.

Table 5 shows the extent to which the operating ratio of Class I carriers declined from 1937 to 1940. In the second quarter of 1941 it stood at 91.4 percent and in the third at 93.8 percent.[28] Net operating revenue more than doubled from 1938 to 1939.[29]

TABLE 5.—*Revenues, Expenses, Operating Ratio, and Net Operating Revenue, Class I, Intercity Carriers of Property, 1937–40*

Year	Number of carriers [1]	Revenues	Expenses	Operating ratio (percent)	Net operating revenue
1938	[2] 883	$299,611,446	$291,156,013	97.2	88,455,442
1937	[2] 883	312,539,792	309,715,778	99.1	2,824,014
Percent change		−4.1	−6.0		+199.4
1939	971	390,951,377	371,576,041	95.0	19,375,336
1938	971	309,853,538	301,009,244	97.0	8,844,293
Percent change		26.2	23.4		119.1
1940	984	437,635,241	418,170,046	95.1	19,465,195
1939	984	387,866,968	368,763,041	95.6	19,103,927
Percent change		12.8	13.4		1.9

[1] Carriers for which comparable information is available.
[2] Includes local carriers.

[26] See below. The *Merchandise Traffic Report* of the Federal Coordinator of Transportation showed an average revenue of 4.44 cents per ton-mile for regular-route common carriers in 1932. Data are given in the accompanying text for 1938 and 1939. In comparing these averages, some allowance should be made for the difference in average haul (about 130 miles in 1932 and 219 miles for a sample of carriers in 1939).

[27] *Middle Atlantic States Motor Carrier Rates*, 4 M. C. C. 68 (1937); *New England Motor Carrier Rates*, 8 M. C. C. 287 (1938); *New England Territory Commodity Rates*, 8 M. C. C. 387 (1938); *Central Territory Motor Carrier Rates*, 8 M. C. C. 233 (1938); *Midwestern Motor Carrier Rates*, 27 M. C. C. 297 (1941); and *Trunk Line Territory Motor Carrier Rates*, 24 M. C. C. 501 (1940).

[28] As noted earlier, compensation for the use of capital or "profit" often takes the form of "bonuses" or other payments, contingent on earnings, to the managing-owners of closely owned enterprises and charged to operating expenses. The expenses shown in Table 5 are overstated, though to only a moderate degree.

[29] Some 197 motor carriers of property had operating revenues of $500,000 or more in 1939. Nine percent of the common carriers of preponderantly general freight, 14 percent of the common carriers of special commodities, none of the contract carriers, 25 percent of the preponderantly local carriers, and 10 percent of the 197 carriers had a recorded net operating loss. The over-all average is not out of line with conditions in other lines of business. Improvement doubtless would be shown in 1940 and 1941.

A series of balance-sheet statements for identical carriers would, of course, throw much light on trends in financial condition. Summarized statements for certain carriers are at hand for 1938 and 1939.[30]

The current position of Class I intercity carriers was as follows in the two years:

Year	Number of carriers	Current assets	Current liabilities	Percent current liabilities of current assets
1938	944	$39,121,163	$34,971,154	89.4
1939	949	41,238,612	36,551,138	88.6

The condition here revealed is far different from that of the railroads (current ratio, 1939, 197.7 percent). Motor carriers, however, have no choice but to abandon their operations when obligations begin to pile up seriously.[31]

It may be noted that 957 carriers in 1939 earned 25.6 percent on their recorded investment despite an operating ratio of about 95 percent.[32] A computed return on investment, is not, however, an adequate measure of the profitableness of motor-carrier operations.

The financial data here surveyed appear to indicate that these particular Class I carriers have effected some improvements in the short period covered, but they do not in themselves suffice to indicate that these carriers are generally in a favorable position.

Data prepared by the Bureau of Motor Carriers show for a sample of 905 Class II and Class III intercity carriers an operating ratio of about 85 percent in 1940 before allowance for the services of owners and members of their families and of 95.5 percent after such allowance. The net operating revenue after such allowance, about $1,044,000, was 4.5 percent of gross revenue of $23,456,000. If allowance be made for return on investment, the net profit was $540,000, or 2.3 percent of gross revenues. A considerable proportion of the carriers had a deficit after allowance for personal services. The figures cited, though subject to some qualifications, may be regarded as giving a reasonably correct picture of conditions of these smaller carriers. Many small carriers have dropped out in the last few years. Motor carriers of property have always been subject to a high rate of turn-over, but since Federal regulation has been in effect, replacements of the ranks have been relatively few. The total number of carriers has declined materially, therefore, in the last 6 years. In many other cases, carriers or their operating rights have been absorbed by other carriers, often at a price much in excess of the value of the tangible property transferred.[33]

The foregoing paragraphs have related to the adequacy of the compensation of capital and, inextricably, of management.

The motor transport industry has provided an expanding number of jobs, either in the way of direct employment or through "owner-operators." This expansion has been in part at the expense of employees of competing agencies of transportation, though it is known that a considerable number of former railroad employees have found work in the industry. Federal regulation of the hours of service of drivers, intended to enable a reasonable amount of time for rest and recreation, have been counted a mixed blessing by the men themselves. Some, and perhaps most, drivers previously subject to long hours have welcomed the placing of a limit on what they can be called upon to do; other drivers, particularly those whose work is seasonal, dislike loss of the opportunity to work long hours and draw extra pay.

Unionization of drivers and other employees has continued. The National Labor Relations Act has been called into play in various instances to protect the right of collective bargaining. Strikes have occurred, some of which have been severe in character.

Table 6 shows the general trend in hourly earnings, 1933 to 1941. While the averages given are not strictly comparable, they suffice to enable the generalization that there has been a material increase in the average hourly compensation of each of the major groups of

TABLE 6.—*Average Earnings per Hour (cents), Employees of Intercity Carriers of Property, 1933, 1935, and 1941, and Percent Increases, 1933 to 1941*[1]

Occupational group	July 1933	October 1935	March 1941
Regular drivers	46.6	56.2	
All crew members	44.2	53.6	67.6
Percent increase		21.3	52.9
Maintenance employees	48.5	54.4	65.4
Percent increase		12.2	35.0
Office and terminal employees	44.7	49.7	56.5
Percent increase		11.2	26.4
All employees	44.9	52.5	65.5
Percent increase		17.0	45.9

[1] Data for 1933 and 1935 are from Federal Coordinator of Transportation, *Hours, Wages, and Working Conditions in Intercity Motor Transportation*. The data for 1933 are based on 8,001, and those for 1935 on 12,951 employees. Data for 1941 are from survey made by the Commission and the Wage and Hour Division of the Department of Labor and relate to 119,520 employees, other than superintendents, managers, accountants, and outside solicitors.

[30] *Statistics of Class I Motor Carriers*, 1938 and 1939.

[31] Earned surplus increased from $11,288,853 for 944 Class I intercity carriers in 1938 to $14,649,664 for 949 such carriers in 1939. Total unappropriated surplus, earned and unearned, increased from $16,396,477 to $19,810,571. Neither increase is of particular significance.

[32] $\frac{\$18,689,058 \text{ net operating revenue}}{\$72,887,694 \text{ investment in operating and intangible property less depreciation or reserve}} = 25.6$ percent

Intangible property (organization, franchises, permits, etc.), less reserve, equaled $10,119,206.

[33] Owners of some small operations have abandoned them and sought more favorable employment in defense plants.

employees and particularly of the drivers. Also, the ratio of total compensation of employees to total operating revenues appears to have advanced somewhat in the past 10 years.[34]

Carriers of Passengers

The volume of intercity passenger business done is substantially larger than that of 1925 and had shown some increase in recent years, prior to the defense activities. The railroads, on the other hand, suffered a loss of 46 percent in passengers carried, 1940 compared with 1926, though only a 32-percent loss in terms of passenger-miles. These losses were not ascribable in the main to bus competition. The bus has created much of the business it does and both bus and rail carriers find their major competition in the private-car field.

The following comparison for 1939 is indicative of the relative position of motor and rail transportation of passengers.[35]

Item	Motor		Rail [1]	
	Number or amount	Percent of total	Number or amount	Percent of total
Number of intercity passengers carried (000)	215,236	49.5	219,923	50.5
Intercity passenger revenue (000)	142,695	27.5	375,759	72.5
Revenue per passenger	$0.66		$1.71	
Revenue per passenger-mile	(2)		[3] $0.021	
Average journey per passenger (miles)	(2)		84.8	

[1] Class I railroads only, which accounted for 99.12 percent of the total rail passenger revenue in 1939.
[2] Not available. A small sample of 29 carriers which reported passenger-miles in 1939 indicates that the average revenue per passenger-mile was $0.015 and the average journey was 77.4 miles. However, these carriers are not representative of the entire industry, since their average revenue per passenger was $1.20 compared with the $0.66 shown above.
[3] For rail coach service, $0.018.

While the two agencies carried approximately the same number of passengers, the average journey by bus was necessarily shorter than that by rail.

Evidence from various sources indicates that the average intercity journey by bus is becoming shorter, whereas the average journey by rail is becoming longer. The reasons appear to lie in the reduction of rail fares, improvements in rail service, and the further loss, in part to busses, of short-haul rail travel. On longer hauls the bus is generally at a disadvantage from the point of view of speed and convenience. However, there are many persons who use busses for long trips for other reasons, such as the greater opportunity to see the countryside and also, in some sections, because of more convenient schedules, better connections, and otherwise more attractive service. The industry is vulnerable to reductions in rail fares and improvements in train service, but it continues to improve its service and to expand as a more convenient and lower-cost carrier in the medium distance and short-haul fields. It has maintained its differential under rail rates despite reductions in these rates in all sections of the country. There has not been the bitter warfare here that has long characterized the relations of rail and motor carriers of property. The Commission has had occasion to concern itself only slightly with passenger rates and such cases have been in the short-haul field, where organized pressure could be developed.

Table 7 shows that the operating ratio of passenger carriers is consistently lower than that of property carriers. A moderate reduction in the ratio occurred from 1937 to 1939, with a slight rise in 1940. In the first quarter of 1941 the ratio stood at 91.7 percent, a reflection in part of seasonal conditions; in the second quarter it was 80.4 percent and in the third, 73.6 percent. Net operating revenue similarly declined from 1939 to 1940.

TABLE 7.—*Revenues, Expenses, Operating Ratio and Net Operating Revenues, Certain Class I Intercity Carriers of Passengers, 1937–40.*

Year	Number of carriers	Revenues	Expenses	Operating ratio (percent)	Net operating revenue
1938	145	$111,047,386	$95,464,884	85.9	$15,582,502
1937	145	104,098,968	90,194,923	86.6	13,904,045
Percent change		+6.67	+8.84		+12.07
1939	152	123,899,080	105,089,592	84.9	18,809,488
1938	152	112,478,530	96,555,305	85.8	15,923,225
Percent change		+10.15	+8.12		+15.34
1940	149	126,322,625	110,022,088	87.1	16,300,537
1939	149	122,918,783	104,153,458	84.8	18,765,324
Percent change		+2.76	+5.63		−13.13

Carriers having operating revenue of $500,000 or more in 1939 in most cases had net operating income.[36] All Class I intercity carriers had net operating revenue of $18,821,380 in 1939, equivalent to 23.5 percent on their investment.[37] It must be repeated, however, that this ratio is not an adequate indication of profitableness.

[34] The source cited in the table shows an average of 37.2 percent for 214 common and 71 contract carriers in 1932. For 634 class 1 common and contract carriers in 1939, the ratio was 41.6 percent. The comparison may be affected somewhat, however, by a difference in the relative number of large and small carriers in the two samples.

[35] This comparison omits the commutation traffic of railroads and the comparable traffic of bus lines. The motor carriers covered are those subject to the general jurisdiction of the Commission. No adjustment is made for instances in which passengers travel over the lines of more than one carrier on a single trip.

[36] Five percent of the intercity, 14 percent of the local, and 6 percent of the two groups had a net operating loss in that year.

[37] $\frac{\$18,821,380 \text{ net operating revenue}}{\$79,928,385 \text{ investment in operating and intangible property, less depreciation or reserve.}} = 23.5$ percent

Intangible property, less reserve, equalled $42,094,851, or more than the investment in carrier operating property less depreciation ($37,833,534). The relation is quite different in the case of Class I property carriers ($10,119,206 of intangible property and $62,768,488 of carrier operating property). The propriety of computing the return on a base which includes intangible property may be questioned, particularly in the case of passenger carriers.

The current position of Class I intercity carriers was as follows in the 2 years:

Year	Number of carriers	Current assets	Current liabilities	Percent current liabilities of current assets
1938	192	$27,324,642	$23,425,230	85.1
1939	149	20,859,048	18,562,845	89.0

Earned surplus increased from $13,863,716 for 192 carriers at the end of 1938 to $26,897,277 for only 149 carriers at the end of 1939.

Comparable financial data are not available for the smaller carriers. Such evidence as is at hand indicates, however, that Class I carriers make a better financial showing than the smaller motor carriers of property. There has been some dropping out, without replacement, in recent years, and various absorptions have occurred.

The information given above throws some light on the adequacy of compensation of capital and management in the intercity bus industry. On the whole, the showing is better than that of Class I motor carriers of property and is not unfavorable in itself.

Earlier remarks relative to the increase in jobs in the trucking industry, the regulation of hours of service, and increased unionization in recent years apply in general to the bus industry also. However, long periods of duty were much less common, relatively, in the bus than in the truck field prior to Federal regulation. Both industries are subject, of course, to the same Federal regulations of the hours of service of drivers.

Table 8 indicates that there has been a substantial increase since 1933 in hourly earnings, except in the case of station and office employees.[38]

TABLE 8.—*Average Earnings Per Hour (Cents), Employees of Intercity Bus Companies, 1933, 1935, and 1941,[1] and Percent Increases, 1933 to 1941*

Occupational group	July 1933	October 1935	March 1941
Drivers	59.3	72.1	79.1
Percent increase		21.6	33.4
Maintenance employees	49.5	57.8	65.7
Percent increase		16.8	32.8
Station and office employees	47.4	51.4	53.4
Percent increase		8.4	12.7
All employees	54.0	62.8	70.8
Percent increase		16.3	31.1

[1] Data for 1933 and 1935 are from Federal Coordinator of Transportation, *Hours, Wages, and Working Conditions in Intercity Motor Transportation*, part I, Motor-Bus Transportation, 1936, p. xvii. The data for 1933 are based on 12,579 employees; those for 1935 on 11,054. Data for 1941 relate to 22,992 employees, other than superintendents, managers, accountants, and outside solicitors.

[38] In appraising trends of this kind, it is necessary to allow for possible changes in the make-up of and standards required of a diversified group of workers, such as those used in offices.

The ratio of total compensation of employees to total operating revenues was about 31.8 percent in 1934[39] and 29.3 percent for Class I carriers in 1939.[40]

Problems, and Appraisal of the Industry's Place Among Transportation Agencies

For convenience in analysis, the problems of the motor transport industry may be grouped under those which are for the most part transitional in character, those of a continuing nature which primarily concern individual carriers, and those of a more basic nature which can best be viewed as industry problems.

Transitional Problems

Carriers of property.—Problems described as transitional are those presented in the adjustment of the industry to the new conditions created by its approach to maturity and its being placed under a broad program of regulation. These problems include the straightening out of claims to operating rights;[41] determination of the legal characteristics of the several types of carriers;[42] determination of the relations of Federal to State authority;[43] the straightening out of tariffs and schedules;[44] the improvement of carrier accounting and statistical methods;[45] the securing of compli-

[39] Coordinator's report, *op cit.*, p. 14, citing data of Motor Bus Code Authority.

[40] *Statistics of Class I Motor Carriers*, 1939, tables 17 and 30.

[41] Under the "grandfather" clause of the Motor Carrier Act, 1935. An enormous volume of evidence, some of it highly controversial and otherwise unsatisfactory, has been considered. Certain of the principles adopted have been attacked in court proceedings.

[42] The drawing of a line of distinction between common and contract carriers and between private and for-hire transportation has been very troublesome. There are other questions, such as the distinction between irregular and regular route operations and as to how far the tendency for the former to become regular route operations may be carried without specific authorization.

[43] The fitting together of Federal and State authority over motor carriers has occasioned no frictions of importance. There have been contentions as to whether certain State powers have been superseded by the Federal regulatory act, but the issues were not of vital importance to the Federal regulatory program at the time they were raised.

Part II of the act has no "Shreveport" provision. The Commission's acquiescence in the amendment which exempts certain legally interstate but physically intrastate motor operations (sec. 204 (a) 4 (a)) indicates its desire to let the States exercise control over matters which, in the public interest, can advantageously be left there. Also, the cooperation of the State commissions provided for in 1935 has served to create a common understanding of problems and good working relations.

The States also have shown a quite general willingness to adopt Federal regulations, in whole or in part, as their own. Thus, there has been general adoption of the Commission's accounting regulations, in whose formulation the States played an active part, and of the safety regulations.

The Commission has had complex questions presented to it in cases involving the determination of whether or not given motor operations are in interstate commerce. It has decided certain basic cases of this kind, without opposition by the States.

[44] In the technical sense of filing tariffs and schedules which comply with the relatively simple requirements of the Commission.

[45] Much work with Class I carriers has been necessary to give the carriers a better understanding of what is required and to secure compliance. Only brief, voluntary reports have been requested of the smaller carriers.

ance;[46] and the dropping out of marginal operators.[47] This list of transitional problems is not complete, but it appears to cover all of the important ones except that of the fitting of rates and charges to the harness of regulation. The transitional phases of this problem can better be discussed at a later point.

Carriers of passengers.—The transitional problems of the intercity bus industry have proved to be far less serious than those of its sister industry. The reason lies in the fact, noted earlier, that the industry had attained substantial maturity some years prior to Federal regulation.[48]

[46] This problem is transitional in the sense that many carriers were wholly unaccustomed to regulation and often unaware of its existence.

[47] Regulation set up various requirements which such carriers could not meet. Some merely dropped out, while others sold their "rights," often unproved. The normal process of attrition, however, has caused many carriers to drop out each year; in these instances regulation merely tends to lessen replacement of the ranks. Measurement of the effects of regulation as such cannot be made. The following comparison therefore is subject to important qualifications:

Number of vehicles per carrier	Applications on file with I. C. C. in June, 1936 [a]		Carriers of record Dec. 31, 1939 [b]	
	Percent of—		Percent of—	
	Carriers	Power units	Carriers	Power units
1	49.4	14.1	34.9	6.7
2	19.6	11.2	20.0	7.8
3–5	18.2	19.2	25.5	18.3
6–10	7.4	15.9	10.9	15.6
11 and over	5.4	39.6	8.7	51.6
Total	100.0	100.0	100.0	100.0

[a] Federal Coordinator of Transportation, *Hours, Wages, and Working Conditions in the Intercity Motor Transportation Industries*, Part II, *op. cit.*
[b] Data from table 1, above.

[48] Generally, there was no serious plethora of operating rights and the rights themselves, with relatively few exceptions, were clearly defined. The major questions which arose related to the territorial scope to be allowed the special or charter operations of regular-route carriers and the treatment of carriers who performed only special or charter operations. These questions appear to have been dealt with in a satisfactory manner by the Commission. (See, as to first point, *Peninsula Transit Corp., Common Carrier Application*, 1 M. C. C. 440 (1937), and as to second, *Red Star Sightseeing Line, Inc., Common Carrier Application*, 1 M. C. C. 521 (1937), *Peninsula Transit Corp. Common Carrier Application*, 1 M. C. C. 440 (1937), *Blue & Grey Sight Seeing Tours, Inc., Common Carrier Application*, 8 M. C. C. 124 (1938). No difficulties were encountered in determining the legal status of operations, as there are practically no contract or private operations, and determination of the relations of Federal to State authority over bus operations has presented no particular problem. Tariffs are relatively simple and the industry was well prepared to file them. Accounting and statistical requirements incident to Federal regulation have occasioned relatively little trouble for these carriers, partly because of their greater size as a rule and partly because of experience in reporting to the States, and the securing of compliance has called forth little in the way of educational work on the part of the Commission. In fact, the compliance problem in general has been of relatively minor proportions. However, there has been real trouble in securing compliance on the part of "travel bureaus" and "sedan operators." Vigorous enforcement efforts have been put forth to lessen unlawful operations of this kind. The operation of school busses on sightseeing excursions has also required attention. Finally, the dropping out of marginal operators has been less of a factor than in the property field. The small bus companies were better prepared for regulation than were small truck operators. There have been many sales of rights. The demise of a few larger carriers in unsound financial condition may have been hastened by regulation.

Continuing Problems

Carriers of property.—The problems to be discussed here are simply the business problems of a regulated industry and take on new aspects from day to day. Pressures of shippers, of competitors in and out of the motor-carrier industry, and of labor, as well as the restrictions set up by regulation and the relief which regulation can afford in some instances, all constitute the general environment of a class of businessmen eager to hold and increase the traffic they handle, and faced with the periodic necessity of "meeting a pay roll".

Under these circumstances, coupled with situations in which there is a plethora of operating rights, the individual carrier must be watchful of moves made by other carriers and ever mindful of how it can fortify and improve its position, whether or not at the expense of other carriers. The threat of the grant of competitive operating rights, the possibility that unifications may be a source of danger, and changes in rates proposed by competitors must be kept always in mind, as, on the other hand, must the possibility of securing additional operating rights or the clarification or modification of existing rights, of effecting an advantageous unification, or of profiting by a change in rates.

A carrier's certificate or permit constitutes the backbone of his operations. It is at once a grant, indefinite in duration,[49] of the privilege of using certain public highways or any highways in a given area, in the conduct of a business enterprise and a protection against unwarranted encroachment, and, on the other hand, a limitation of the things a carrier may do, as contrasted with what he would like to do. That these rights have large monetary values has been demonstrated in a long line of finance decisions. Dilution of the earning power they create is therefore resisted, as is indicated by protests made on "grandfather" applications and particularly on applications to institute new operations or to extend existing ones as to territories or commodities.[50] The Commission has construed the statute as requiring that no new operating rights be granted if existing motor services are reasonably adequate or can be improved or expanded to meet the needs of the public or of the particular shippers in question. The existence of rail service is not allowed to control except in those uncommon instances in which

[49] Unless revoked for cause. The power of revocation is circumscribed, but it has a salutary effect, nevertheless.

[50] The kind of right applied for is, of course, a matter calling for particular scrutiny. An application for the right to haul "general commodities" commonly raises many more protests than one which involves limited commodities. Often, applications of the latter kind are not protested, and those of the general type which involve the furnishing of service to places off the beaten path commonly are not contested. Common carriers may protest applications of contract carriers, but the reverse rarely occurs.

such service provides all of the advantages of motor service. Water carriers have shown little interest in motor-carrier certificate or permit proceedings. In some cases, the abandonment of rail lines has been the occasion for grants of operating rights, generally to the railroad concerned or a subsidiary. Very frequently applications for rights which would involve service to particular shippers fail to be approved not only because of the existence of adequate service but because the real intent is to provide service at lower rates. The Commission has held uniformly that such intent has no place in an application proceeding and has pointed out that there are other ways of seeking an adjustment of rates.

Unifications most commonly take the form of outright purchases of the property and operating rights of other carriers. In other cases, stock control is obtained and, in still others, mergers, consolidations, or leases are effected. A given carrier is concerned about the unification of other carriers for the following reasons: Improvements that may be effected in competitive services, as by the setting up of new through routes [51] or the obtaining of operating rights over short cuts; the possibility of a more complete or effective competitive coverage of a territory already occupied; more aggressive and powerful management; and the economies which competitors may be able to effect. In the great majority of cases the Commission has permitted proposed unifications to be carried into effect.[52]

Changes in rates proposed by a competitor, whether motor (common or contract) or rail, or changes, which a given carrier may consider it in his interest to make or propose, are a vital part of the competitive process. The minutiae of rate changes cannot be gone into here.[53] Regulation necessarily has resulted in greater emphasis on service as a basis of traffic solicitation.

The extent of compliance with Federal and State regulations by competitors is always a matter of concern to individual carriers who may be affected. While improvement in this respect is occurring, the problem is one which in some degree will always exist.

Proper working relations with employees are also, of course, a primary concern of the individual carrier. Observance of regulations, safe driving, good conduct, and careful use of equipment are matters of particular importance in this industry, owing to the extent to which driving personnel is without direct supervision. Training courses, safety contests, and company regulations are varyingly resorted to. The prevention of accidents is an ever-present problem, which some carriers have coped with much more successfully than others. On the other hand, the carrier has to consider the demands of labor for higher wages and changes in working conditions.

Carriers of passengers.—Here again the bus industry presents fewer problems. The fact that it is a much more highly concentrated industry than is motor transportation of property accounts in part for this difference. The broad lines of the industry are more clearly defined and there is a greater degree of adjustment of the carriers, one to the other. Proposed unifications or applications for new operating rights, other than those of minor character, therefore give rise to more interest, relatively, than they generally do in the property field. The Commission has had to make a number of decisions in which the question of preserving competition has been raised.

No emergency calling for minimum rate orders has arisen. The carriers have been allowed to adjust their rates largely in unison and as they have found it desirable to do so to fit the needs of their business and particularly as changes in rail rates have required sympathetic changes in bus fares. As a whole, the bus industry places relatively more emphasis on the selection and training of its drivers. Otherwise, the continuing problems of this industry are similar to those previously mentioned as facing the trucking industry.

Problems Common to For-Hire Carriers of Property

Criticisms of the industry by its competitors.—At the time the Federal Coordinator of Transportation made his legislative and economic studies in the thirties, the motor carrier industry was being subjected to three general lines of criticism by the railroads, as follows:

(*a*) That lack of Federal regulation created an unfair situation. This criticism has been met through the regulation provided in 1935, though its administration has not in all respects satisfied the railroads.

(*b*) That the intercity trucking industry derived an unfair advantage through the maintenance of low labor standards. That these criticisms were carried too far

[51] Problems of major importance are involved here. The Commission has held that unifications which promise to result in new and better service are not subject to a finding that public convenience and necessity require such service (*Keeshin Motor Exp. Co., Inc., (Illinois)—Leases*, 1 M. C. C. 373, 380–381 (1936). It has also held that injury to competitors is not a ground for denying an application for a unification. (*English—Purchase—Robinson*, 5 M. C. C. 221, 223–224 (1937); *Transamerican Freight Lines, Inc.—Purchase—Gorman*, 5 M. C. C. 712, 713 (1938)). See, however, *Consolidated Freightways, Inc.—Purchase—Reymers*, 36 M. C. C. 623 (1941).

[52] For about 2 years it has generally required the amortization over a period of from 2 to 10 years of the amounts paid for intangibles and more recently has required that they be immediately written off to surplus, if the surplus will permit. Vendors, often in bad financial condition, frequently have had substantially nothing but bare operating rights to sell, and not uncommonly the price paid has much exceeded the value of these rights to the vendor. The Commission also has insisted on simplication of corporate structures.

[53] Carriers who face the competition of "exempt" carriers, whose rates are unregulated, have particular difficulties, which are added to by leasing and other practices resorted to by carriers which transport exempt commodities.

was revealed by an examination of the facts, but that conditions of unduly long hours and low pay characterized many operations in the property-carrying field cannot be questioned.[54] Wages have subsequently been increased and hours shortened.

(*c*) That the motor transport industry does not pay adequately for the use of highway facilities. A report of the Federal Coordinator of Transportation did not, in any substantial degree, sustain the position of the railroads.[55] This finding has been severely criticized by the railroads.[56] A review of the Coordinator's report and of the position of the railroads and other parties in interest is being made by the special board of investigation and research created by the Transportation Act of 1940.

Leasing of transportation facilities and services.—Leasing practices are recognized to have grown materially in recent years. The most common type of leasing and one of long standing is that of so-called "owner-operator" equipment. It takes two forms, the first of which involves a more or less continuing and exclusive engagement of a given owner-operator by a given carrier, and the second short-term leasing, often for a single trip.[57] Quite commonly the owner-operator has two or more units and in some cases a very large number, which he provides, generally with drivers, to a carrier or to a number of carriers. An association of owner-operators stated in 1940 that there are 20,000 or more such operators and that they have more than 30,000 vehicles. The accuracy of these figures has not been checked, but it can readily be seen that a large amount of freight is carried under such arrangements. Some motor carriers depend largely or almost wholly on such leased equipment.

The other type of leasing noncarrier equipment to for-hire carriers, that done by rental agencies, is not of sufficient interest in the present connection to warrant comment.

Carriers also lease the equipment of other carriers. The most prevalent of such arrangements are as follows: (1) Interchange of equipment between carriers to complete transportation of shipments over lines of two or more carriers under joint or combination rates. This arrangement is much like the interchange of freight and passenger cars between railroads, except that motor equipment is confined to use by the particular carriers performing the service. This practice is generally limited but is growing in importance.[58] (2) Use of the service of line-haul carriers in the movement of traffic accepted by another such carrier. This practice is a common one among the household goods carriers and is found to a considerable extent in the case of general commodity carriers, particularly in certain sections of the country. It is resorted to either when a carrier's own equipment is temporarily overtaxed or to correct a chronically unbalanced load situation and thus avoid expensive empty or light mileage by both the so-called lessee and lessor. There are possibilities of violations of the Act which cause this practice to be questioned in some quarters.

There also are cases in which carriers "lease" equipment to shippers. This practice, prima facie, is unlawful, though it has been authorized in a few instances.

Leasing presents an economic problem for the motor-carrier industry through creating differences in costs. A carrier who uses the trip-lease type of owner-operator may in some instances derive an advantage over a competitor who operates with owned equipment or that engaged under long-term leases. Also, the carrier who can build up his own load factor by engaging other carriers to carry freight that is out of balance derives an advantage over carriers who use only their own equipment. Similarly, the lessor recovers more of his costs. Both types of leasing provide the advantages of pooling of equipment and of lower costs in other respects. However, there is the possibility of violations of tariffs and operating rights, and certain operating practices and the lack of definite responsibility to the public, often found in the case of the itinerant owner-operator, if not in other instances of leasing, are matters to be considered.

Organization for common action.—Motor carriers of property, after a preliminary period in which there were rival national associations, settled upon a kind of federated organization, with a national association standing at the head of and supported by State associations. This association, which functions through several divisions or conferences, such as the regular-route common-carrier conference and the contract-carrier conference, has exerted a very effective leadership. It has prepared a national motor-rate classification, which it revises from time to time, participates in the advocating or opposing of legislation of interest to the industry and in certain classes of cases before the Commission and the courts, engages in promotional activities, pub-

[54] Federal Coordinator of Transportation, *Comparative Labor Standards in Transportation*, 1937, and underlying reports.

[55] *Public Aids to Transportation*, vols. I and IV, 1940.

[56] Association of American Railroads, *What is Public Aid to Transportation*, 1940.

[57] Various owner-operators have claimed the status of carriers. The Commission has rejected this contention where it is shown that the vehicles are operated under the lessee's direction and control and under its responsibility to the general public and to the shipper. See *Dixie Ohio Express Co. Common Carrier Application*, 17 M. C. C. 735 (1939). The Commission's petition has been sustained in two cases carried to the Supreme Court.

[58] As evidenced by the recent setting up of transcontinental systems comprised of independent carriers.

lishes a weekly newspaper, and puts out a large volume of current information, such as digests of Commission and court decisions and of legislation.

There are other associations made up of specialized haulers, such as two which represent groups of carriers of household goods and carriers of automobiles.

Also to be mentioned are the motor carrier rate bureaus, of which there are upwards of 100. Their functions are those of preparing and publishing tariffs, initially considering rate changes proposed by shippers or carriers, adjusting differences between carriers and shippers, and taking such part in proceedings before regulatory bodies as is considered appropriate. Some bureaus cover a wide range of commodities; others specialize on individual commodities, such as household goods, petroleum products, or automobiles. Some take in the entire country; at the other extreme are those which confine their membership to carriers of a single State or of an area within a State. The larger bureaus have generally worked out divisions of territory, though New England, for example, has two major competing bureaus. There are, in addition, many individuals who publish tariffs as agents for carriers.

It sometimes is urged that these bureaus serve to advance the interests of some carriers to the injury of others, or that they lessen the opportunities for the individual carrier to charge, or place before the regulatory bodies, rates of their choosing. There are advantages in having a preliminary, unofficial review of proposed rate changes. Many, on their face, are ill considered and would have no chance of becoming effective if presented directly to the regulatory bodies. A useful function also is served by affording opportunity for other interested carriers to be heard before a rate proposal is carried too far. Certain bureaus, under their bylaws, are required to publish any rate a member desires, though they may oppose its acceptance before the regulatory body; some allow a member to publish rates which do not meet with the approval of the bureau; and some take the position that a member may not publish or participate in rates to which the bureau objects.[59] The work done by the bureaus reflects the known interdependence and complexity of motor-carrier rates. Apart from possible abuses, rate bureaus are subject to no criticisms which cannot be leveled at the regulatory policy laid down in a succession of Federal acts. As an implement in the conduct and regulation of a business, they are not free from faults, but they serve a useful purpose. The railroads have had similar agencies for years,[60] and shipping lines have their conferences, a means of securing cooperation which dates from a remote period in the past.

Determination of the "Inherent Advantages" of Motor Transportation

This basic question has necessarily been left until the last. Criticisms not infrequently are made to the effect that, from the standpoint of the public interest, motor transportation of property is being conducted in fields which do not lie within its natural aptitudes or in which it is merely a competitive duplication of the services which other carriers, mainly the railroads, can render to the satisfaction of the public. These critics concede that individual motor carriers cannot long indulge in unprofitable operations. Their alternatives in such circumstances are to cut their costs or retire. Inasmuch as the record shows that motor transportation continues to gain at the expense of the railroads, it must follow that the basic trouble, if there be any, lies not in what motor carriers do but in the opportunities created for them by the practices of their competitors. It frequently is urged, therefore, that the railroads are not expressing their "inherent advantages" in their rates and that wholesale revisions of these rates will serve to place motor transportation in its proper and limited field of service, to the advantage of the public. The motor carriers themselves generally resist this line of reasoning and any measures intended to give it practical force. In the main, the tendency to lengthen routes and otherwise to expand the scope of operations continues.

It would be altogether impracticable and inappropriate in this paper to attempt even a general finding as to the place of motor transportation in the entire scheme of transportation. All that can be undertaken here is the outlining of a broad method of approach to this problem and the bringing together of such data as can be had which illustrate certain of its specific phases.

Basically, the analysis of this problem calls for a most skillful synthesis of service, cost, and other considerations as they present themselves in the complex system of transportation facilities and services available today. However, even if given adequate quantitative measurements of all pertinent facts, conditions will remain which will try the wisdom of those who endeavor to translate these facts into a plan of action. Comparisons of costs and service often may fall short of giving a sound answer.[61] Such comparisons may be

[59] See *Periodicals, etc., Savannah, Ga., to Birmingham, Ala.*, 30 M. C. C. 391 (1941).

[60] See *Trans-Continental Freight Bureau*, 77 I. C. C. 252 (1923).

[61] An indication of this basic difficulty is provided by the fact that substantially all transportation agencies render "efficient" and "less efficient" service with some, at least, of the same facilities and often contemporaneously. The "less efficient" service they render makes

expected at most to afford certain general guides for the handling of very complex situations and certain more specific guides for the determination of simpler or more easily isolated issues.[62]

Survey of existing services and facilities.—Ideally, an appraisal of the relative service advantages and disadvantages of different forms of transportation would start with shippers' requirements as an expression of standards for use in measuring what is being accomplished. Actually, of course, there are no specific standards of this kind. The carriers themselves, under pressure from other carriers and individual shippers, determine the standards that prevail. Resort must therefore be had to comparisons of the services of rival forms of transportation. Also, conditions vary greatly from place to place and, at this time, are highly dynamic. Measurements are difficult for these additional reasons. All that can be said is that shippers want "good" or the "best possible" service, coupled with lowest possible rates. Under present competitive conditions, their desires are being met to a degree undreamed of in earlier days.

Motor transportation between given points or in given areas is rendered under a far more complex carrier set-up than is rail service.[63] There are not only more motor than rail carriers, but they vary in character. Common and contract carriers have differing modes of operation and legal characteristics, and "exempt" for-hire carriers and private carriers must not be overlooked. Cutting across these differences are those which arise from the varying types of service which motor carriers render. Some is as definitely scheduled as rail service; at the other extreme is individualized "call and demand" service. Some carriers serve the intermediate territory, while others furnish only through service from terminal to terminal. There is also a size differentiation, with a range from one-truck operators with their conception of what is good business and service, to large, integrated operations, with a different conception. On the other side, there are rail and express services, largely standardized as to type. There also are the services of freight forwarders, which employ rail, truck, or water carriers for the furnishing of the line-haul service and which sometimes bring these agencies into coordination through using the one to complete a haul begun by the other. An inventory should be made in concrete situations of the amount and characteristics of the service rendered by each form of transportation, coupled, if possible, with comparisons of the relative position of the different agencies in an earlier period, in order that shifts in the public's calls for particular services may be indicated.

The services rendered by the several means of transportation should then be rated as to quality. Involved here are such well-known factors as speed or over-all elapsed time between preparation of shipment and its delivery at destination, frequency of service (a variant of the foregoing), convenience with respect to degree of interference with shipper's operations, completeness, etc., responsibility in the event of loss and damage and of accidents, adherence to schedules, special protection and handling, etc.

The relative importance which shippers attach to these several considerations has been surveyed at various times. These surveys permit of no definite determination of the relative importance of service and cost considerations, though it is believed that purely "service" considerations, not influenced by comparisons of costs, are a relatively minor factor in the choice of motor transportation.

Conditions have changed since the last comprehensive survey of this kind.[64] Thus, the spread of free rail pick-up and delivery service on less-than-carload traffic has lessened an important original advantage of the truck.[65] The railroads also have speeded up their main-line merchandise trains since 1933. Complex terminal operations remain a handicap for the railroads in competing with trucks, though here also improvement has occurred. In other cases, the railroads have worked out coordinated rail-truck services which are as fast as those by truck. These cases should, however, be treated in a distinct category in comparisons of service. Improved vehicles and more and better roads have enabled a speeding up of truck schedules

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it more possible to render the "efficient" service. Also, certain carriers, especially the railroads, provide service which is "efficient" but which cannot pay its full share of costs. If this traffic is to continue to move, other traffic must pay more than full costs. If costs are, however, to be a major measure of inherent advantages and these advantages are to be the keystone of future transportation policy, special consideration must be given conditions of the kinds indicated or the possible far-reaching effects on the national economy of changed transporation charges must be faced.

[62] In dealing with so complex a subject as the comparison of the costs and services of different forms of transportation, it has been a common practice to gather a mass of statistical material and to present averages and other computations drawn therefrom. Often and perhaps generally, the results cannot be related to or be made to illuminate specific situations. This method of approach yields useful material and is highly necessary, but it can become significant in a practical way only if detailed studies of concrete situations are contemporaneously carried out. The case study method of approach strongly commends itself. An early use of this method is found in *The Shipping Situation Between New York City and Philadelphia*, Russell W. Talbot, 1931.

[63] For simplicity, this analysis is confined to motor and rail transportation.

[64] Federal Coordinator of Transportation, *Merchandise Traffic Report*, p. 5.

[65] This service is not available, except at the expense of the shipper, at points beyond a defined distance or on shipments carrying less than a designated minimum freight charge, and there are, of course, many places without rail services and beyond the rail pick-up and delivery zone.

in some areas; increased road and street congestion, regulations of drivers' hours of service, and varying size and weight limits[66] and other regulations of the States have had a contrary effect. Tie-ups of truck operations by reason of ice and snow continue, but to a less extent than formerly, owing to the prompter clearing of roads.[67]

There is substantially no class of traffic handled by railroad that is not handled to some extent by truck.[68] Coal, wheat, various ores, and other traffic commonly classified as "tied to the rails" move, in some cases to a substantial extent, by truck. The truck, whether private or for-hire, fits in so closely with the needs of agriculture that a large segment of traffic has been completely lost to the rails.

Table A indicates that, while the majority of intercity for-hire carriers transport special commodities, approximately one-half of the tonnage is transported by carriers classified as general commodity haulers. The commodities carried by the latter group are in many cases, of course, the same as those transported by special haulers. There is, unquestionably, therefore, a high degree of concentration on manufactured or processed commodities. A much smaller percentage of contract than on common carriers transport general freight, as is also shown by Table A.[69]

Interest also attaches to the relative size of shipments. The average less-than-carload shipment weighs about 475 pounds.[70] This average does not differ materially from that for less-than-truckload traffic. Shipments of merchandise traffic in scheduled motor service are generally smaller than those which move in irregular route service.[71] On the other hand, shipments of special commodities by motor vehicle, while much larger than those indicated above, are as a rule smaller than those by rail. The average truckload shipment, according to a small sample, weighs about 22,000 pounds, though this much tonnage may not move in all cases in a single vehicle. The average carload shipment by rail weighed 36.8 tons in 1939, but of course this figure is no measure of the size of shipments, as a given shipment may range from one car to many cars and up to a trainload. About 98 percent of rail traffic moves on carload rates, as contrasted with the much lower percentage of truck traffic that moves on truckload rates.[72]

There is also the distance factor to consider. For-hire carriers, particularly those subject to the Commission's general jurisdiction, necessarily operate over somewhat longer distances than the general run of users of the highways for commercial purposes. Their average haul is about 150 miles.[73] There is substantial evidence that this average is materially higher than it was a few years ago. The rail average, covering a different consist of traffic, was 351 miles in 1939, or

[66] See Interstate Commerce Commission, *Federal Regulation of the Sizes and Weight of Motor Vehicles, op cit.*

[67] *The Merchandise Traffic Report* and the *Freight Traffic Report* of the Federal Coordinator of Transportation compared operating schedules of rail and motor carriers in 1933. It is a comparatively simple task to make such a comparison for a defined area. The overnight run with first morning delivery is, of course, the backbone of motor operations. Such service is rendered from Chicago to Memphis, 562 miles, Chicago to Kansas City, 508 miles, and Milwaukee to St. Louis, 378 miles. There is second morning delivery from Chicago to points as distant as Oklahoma, Tennessee, Colorado, and Texas; sixth morning delivery is scheduled from Chicago to west coast points. It takes a very expeditious type of train service to effect equal speed to all but the more distant points. This statement is less true of small shipments than of carload and truckload shipments, as the latter do not involve handling on terminal floors. Also, truck freight as a rule is picked up at a later hour in the day than is rail freight.

[68] Reference here is to over-the-road hauls and not to pick-up and delivery operations.

[69] The following over-all comparison is of considerable significance, though the data include private truck movements and also some movements of an essentially local character.

Commodities carried	Percent of total loaded trucks recorded at loadometer stations in 38 States [a]	Percent of tons originated by Class I line-haul railroads, 1938
Products of agriculture	13.2	12.4
Animals and products	13.4	1.9
Products of mines	6.6	52.9
Products of forests	5.1	5.7
Manufactures and miscellaneous	53.2	25.2
Mixed freight	8.5	[b] 1.9
Total	100.0	100.0

[a] From Highway Planning Surveys, made mostly in 1936 and 1937.
[b] Less-than-carload.

[70] Study of less-than-carload traffic for week of Sept. 8 to 14, 1939 (exhibit filed in Docket 28,300 by Association of American Railroads).

[71] *New England Motor Carrier Rates*, S M. C. C. 281, 315 (1938).

[72] In this general connection, see Interstate Commerce Commission, *Federal Regulation of the Sizes and Weight of Motor Vehicles, op cit.*, appendix D, pp. 643–653, for discussion of effects of limitations of sizes and weights on truck shipments and rates.

[73] About 80 percent of all trips outside of city limits made by trucks are for distances, one way, of less than 20 miles. Such trips account, however, for only about 34 percent of the total over-the-road mileage of trucks. Of all such mileage, about 63 percent is urban to urban, 29 percent rural to urban or vice versa, 7 percent rural to rural, and 1 percent, trans-State. About 76 percent of all truck mileage is on trips of less than 100 miles, whereas only 21 percent of the mileage of for-hire carriers transporting general commodities is so classified. The average haul of such carriers is about 150 miles. A distribution of tons transported by haulers of general commodities, by one-way route lengths, found in *Federal Regulation of the Sizes and Weights of Motor Vehicles, op. cit.*, pp. 96, 596–597, follows:

Route length (miles):	*Percent of total tonnage*
Under 100	37.2
100–199	34.8
200–299	15.0
300 and over	13.0
Total	100.0

This summary, being in terms of route length, tends, however, to overstate somewhat the importance of the longer hauls.

The Merchandise Traffic Report, op. cit., p. 25, indicated the following distribution of shipments moving by trucks in 1932: 1–50 miles, 48.7 percent; 50–250 miles, 41.1 percent; over 250 miles, 10.2 percent. The average haul was 130 miles. See also Federal Coordinator of Transportation, *Regulation of Transportation Agencies*, Senate Doc. 152, 73d Cong., 2d sess., p. 262, which gives an average of 100 miles in 1932.

TABLE A.—*Percentage distribution by size of company and class of operation of number of companies, power units, vehicle-miles, tons transported, and revenues of predominantly intercity carriers of record subject to the general jurisdiction of the Interstate Commerce Commission in 1939*

Size of company (number of power units) (class II and III carriers)	Class of operation																		
	General commodities							Special commodities							Totals				
	Regular route			Irregular route			Total-general commodities	Regular route			Irregular route			Total-special commodities	Regular route	Irregular route	Common	Contract	All
	Common	Contract	Total	Common	Contract	Total		Common	Contract	Total	Common	Contract	Total						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
	Percent of total carriers																		
1	17.8	0.3	18.1	8.4	0.4	8.8	26.9	8.7	3.5	12.2	48.8	12.1	60.9	73.1	30.3	69.7	83.7	16.3	100.0
2	19.5	.2	19.7	9.3	.4	9.7	29.4	6.2	3.1	9.3	49.2	12.1	61.3	70.6	29.0	71.0	84.2	15.8	100.0
3	20.3	.1	20.4	8.4	.3	8.7	29.1	4.3	2.8	7.1	50.6	13.2	63.8	70.9	27.5	72.5	83.6	16.4	100.0
4	22.1	.2	22.3	10.0	.7	10.7	33.0	3.9	3.3	7.2	45.8	14.0	59.9	67.0	29.5	70.5	81.8	18.2	100.0
5	22.1	.0	22.1	12.0	.4	12.4	34.5	3.6	2.5	6.1	45.3	14.1	59.4	65.5	28.2	71.8	83.0	17.0	100.0
6–10	25.8	.3	26.1	12.8	.3	13.1	39.2	2.2	3.1	5.3	40.9	14.6	55.4	60.8	31.4	68.6	81.7	18.3	100.0
11–15	32.2	.0	32.2	18.3	.4	18.7	50.9	1.2	1.6	2.8	30.7	15.6	46.3	49.1	35.0	65.0	82.4	17.6	100.0
Over 15	30.4	.0	30.4	21.1	1.8	22.9	53.3	3.3	.6	3.9	29.5	13.3	42.8	46.7	34.3	65.7	84.3	15.7	100.0
Total	20.6	.2	20.8	10.0	.4	10.4	31.2	5.8	3.1	8.9	47.0	12.9	59.9	68.8	29.7	70.3	83.4	16.6	100.0
Class I	60.8	2.1	62.9	5.0	3.0	8.0	70.9	2.7	3.0	5.7	12.7	10.7	23.4	29.1	68.6	31.4	81.2	18.8	100.0
Total, all	22.5	.3	22.8	9.7	.5	10.2	33.0	5.7	3.1	8.8	45.4	12.8	58.2	67.0	31.6	68.4	83.3	16.7	100.0
	Percent of total power units																		
1	17.8	0.3	18.1	8.4	0.4	8.8	26.9	8.7	3.5	12.2	48.8	12.1	60.9	73.1	30.3	69.7	83.7	16.3	100.0
2	19.5	.2	19.7	9.4	.4	9.8	29.5	6.2	3.1	9.3	49.1	12.1	61.2	70.5	29.0	71.0	84.2	15.8	100.0
3	20.3	.1	20.4	8.4	.3	8.7	29.1	4.3	2.8	7.1	50.6	13.2	63.8	70.9	27.5	72.5	83.6	16.4	100.0
4	22.1	.2	22.3	10.0	.7	10.7	33.0	3.9	3.3	7.2	45.8	14.0	59.8	67.0	29.5	70.5	81.8	18.2	100.0
5	22.1	.0	22.1	12.0	.4	12.4	34.5	3.6	2.5	6.1	45.3	14.1	59.4	65.5	28.2	71.8	83.0	17.0	100.0
6–10	26.2	.4	26.6	13.0	.2	13.2	39.8	2.2	2.9	5.1	40.4	14.7	55.1	60.2	31.7	68.3	81.8	18.2	100.0
11–15	32.6	.0	32.6	18.4	.4	18.8	51.4	1.2	1.5	2.7	30.5	15.4	45.9	48.6	35.3	64.7	82.7	17.3	100.0
Over 15	29.3	.0	29.3	19.8	2.2	22.0	51.3	3.3	2.6	5.9	28.8	14.0	42.8	48.7	35.2	64.8	81.2	18.8	100.0
Total	24.0	.2	24.2	12.4	.6	13.0	37.2	3.9	2.8	6.7	42.3	13.8	56.1	62.8	30.9	69.1	82.6	17.4	100.0
Class I	66.7	2.0	68.7	4.1	2.2	6.3	75.0	2.1	1.9	4.0	11.4	9.6	21.0	25.0	72.7	27.3	84.3	15.7	100.0
Total, all	40.3	.9	41.2	9.2	1.2	10.4	51.6	3.2	2.5	5.7	30.5	12.2	42.7	48.4	46.9	53.1	83.2	16.8	100.0
	Percent of total vehicle-miles in other than local service																		
1	17.1	0.3	17.4	7.4	0.5	7.9	25.3	8.2	5.4	13.6	46.5	14.6	61.1	74.7	31.0	69.0	79.2	20.8	100.0
2	17.9	.3	18.2	8.4	.3	8.7	26.9	7.5	4.7	12.2	46.1	14.8	60.9	73.1	30.4	69.6	79.9	20.1	100.0
3	18.9	.1	19.0	6.6	.2	6.8	25.8	5.3	4.5	9.8	48.2	16.2	64.4	74.2	28.8	71.2	79.0	21.0	100.0
4	21.2	.3	21.5	8.3	.9	9.2	30.7	4.0	4.1	8.1	46.0	15.2	61.2	69.3	29.6	70.4	79.5	20.5	100.0
5	23.0	.0	23.0	10.3	.6	10.9	33.9	3.4	3.4	6.8	40.8	18.5	59.3	66.1	29.8	70.2	77.5	22.5	100.0
6–10	25.3	.7	26.0	12.0	.1	12.1	38.1	2.5	4.2	6.7	38.5	16.7	55.2	61.9	32.7	67.3	78.3	21.7	100.0
11–15	30.9	.0	30.9	16.6	.2	16.8	47.7	1.6	1.9	3.5	31.5	17.3	48.8	52.3	34.4	65.6	80.6	19.4	100.0
Over 15	30.9	.0	30.9	17.9	1.9	19.8	50.7	5.1	1.7	6.8	28.6	13.9	42.5	49.3	37.7	62.3	82.5	17.5	100.0
Total	23.1	.3	23.4	10.8	.5	11.3	34.7	4.5	3.9	8.4	40.9	16.0	56.9	65.3	31.8	68.2	79.3	20.7	100.0
Class I	67.3	1.4	68.7	3.6	1.8	5.4	74.1	1.7	2.0	3.7	13.0	9.2	22.2	25.9	72.4	27.6	85.6	14.4	100.0
Total, all	42.5	.8	43.3	7.6	1.0	8.6	50.9	3.3	3.1	6.4	28.7	13.0	41.7	48.1	49.7	50.3	82.1	17.9	100.0
	Percent of total tons transported																		
1	14.3	0.6	14.9	6.8	0.5	7.3	22.2	8.2	4.5	12.7	47.1	18.0	65.1	77.8	27.6	72.4	76.4	23.6	100.0
2	15.7	.4	16.1	11.5	.4	11.9	28.0	5.9	3.9	9.8	46.0	16.2	62.2	72.0	25.9	74.1	79.1	20.9	100.0
3	17.0	(*)	17.0	8.3	.3	8.6	25.6	4.4	4.9	8.4	47.6	18.4	66.0	74.4	25.4	74.6	77.3	22.7	100.0
4	18.9	.1	19.0	9.4	1.0	10.4	29.4	3.8	4.1	7.9	44.5	18.2	62.7	70.6	26.9	73.1	76.6	23.4	100.0
5	18.2	.0	18.2	12.2	.7	12.9	31.1	3.8	2.1	5.9	44.3	18.7	63.0	68.9	24.1	75.9	78.5	21.5	100.0
6–10	23.1	.4	23.5	13.6	.1	13.7	37.2	2.1	3.6	5.7	37.6	19.5	57.1	62.8	29.2	70.8	76.4	23.6	100.0
11–15	27.9	.0	27.9	18.7	.4	19.1	47.0	.7	1.8	2.5	31.0	19.5	50.5	53.0	30.4	69.6	78.3	21.7	100.0
Over 15	24.0	.0	24.0	23.7	2.7	26.4	50.4	3.4	.5	3.9	31.2	14.5	45.7	49.6	27.9	72.1	82.3	17.7	100.0
Total	20.6	.2	20.8	13.3	.7	14.0	34.8	3.7	3.1	6.8	40.3	18.1	58.4	65.2	27.6	72.4	77.9	22.1	100.0
Class I	56.4	1.7	58.1	4.4	2.2	6.6	64.7	2.4	5.2	7.6	11.3	16.4	27.7	35.3	65.7	34.3	74.5	25.5	100.0
Total, all	37.6	.9	38.5	9.1	1.4	10.5	49.0	3.1	4.1	7.2	26.5	17.3	43.8	51.0	45.7	54.3	76.3	23.7	100.0
	Percent of total revenue																		
1	18.6	0.4	19.0	7.1	0.5	7.6	26.6	6.8	5.7	12.5	41.5	19.4	60.9	73.4	31.5	68.5	74.0	26.0	100.0
2	20.1	.4	20.5	8.4	.3	8.7	29.2	6.2	4.6	10.8	43.5	16.5	60.0	70.8	31.3	68.7	78.2	21.8	100.0
3	21.5	.1	21.6	7.3	.3	7.6	29.2	5.5	4.2	9.7	44.5	16.6	61.1	70.8	31.3	68.7	78.8	21.2	100.0
4	23.7	.3	24.0	8.6	.9	9.5	33.5	3.9	4.0	7.9	42.9	15.7	58.6	66.5	31.9	68.1	79.1	20.9	100.0
5	23.7	.0	23.7	11.9	.4	12.3	36.0	3.7	3.2	6.9	40.2	16.9	57.1	64.0	30.6	69.4	79.5	20.5	100.0
6–10	29.2	.5	29.7	11.0	.2	11.2	40.9	2.4	3.7	6.1	36.7	16.3	53.0	59.1	35.8	64.2	79.3	20.7	100.0
11–15	35.3	.0	35.3	16.2	.4	16.6	51.9	1.4	1.8	3.2	29.2	15.7	44.9	48.1	38.5	61.5	82.1	17.9	100.0
Over 15	33.4	.0	33.4	20.3	1.7	22.0	55.4	3.3	.5	3.8	28.9	11.9	40.8	44.6	37.2	62.8	85.9	14.1	100.0
Total	26.6	.3	26.9	11.4	.5	11.9	38.8	3.8	3.5	7.3	37.8	16.1	53.9	61.2	34.2	65.8	79.6	20.4	100.0
Class I	70.2	1.5	71.7	3.6	1.7	5.3	77.0	1.8	2.0	3.8	11.5	7.7	19.2	23.0	75.5	24.5	87.1	12.9	100.0
Total, all	50.6	.9	51.5	7.1	1.2	8.3	59.8	2.7	2.6	5.3	23.4	11.5	34.9	40.2	56.8	43.2	83.8	16.2	100.0

*Less than 0.1 percent.

194 miles if figured for the individual railroad, the basis here used in the case of motor carriers.

Statements have been made in the past that, generally speaking, hauls up to about 250 miles were the maximum distance at which motor carriers could successfully compete with the rails. It is known, however, that much of the traffic of some of the most successful carriers is hauled much greater distances, up to 1,000 miles or more. These cases are relatively limited, however, except in the case of special commodities, such as household goods and perishables, or where an especially favorable set-up gives assurance of adequate back hauls. The distance factor alone, therefore, is not indicative of the limitation of motor-carrier operations. The territory served, the class of traffic, and the competing rate structure are probably more important factors.

Surveys of the kinds indicated above should also bring together data as to the facilities (highways, vehicles, and terminals) available in given areas and for given types of service. So far as trucks are concerned and barring congested areas and conditions created by the present emergency, there is more evidence of a surplus than of a lack of facilities. A comparable inventory of rail and other facilities would also reveal a general surplus of fixed facilities. Owing to the shorter average life of motor equipment and the relatively small investment in fixed facilities, overprovision of facilities is subject to self-correction to a greater extent in the motor field than it is in the case of the railroads. There is, of course, the problem of the public interest in preserving as many rail facilities as the carriers would like to continue in service.

An inventory of the kind suggested would make for clarity in one special respect. It would show the extent to which trucking operations are of no concern or of positive benefit to competing forms of transportation, as where they serve as feeders or operate in low-traffic areas in which competitive rail service is uneconomical. The taking of such an inventory is a first step but a very comprehensive one. As indicated earlier, case studies suggest themselves.

Survey of costs of carrier services.—A survey of costs is far more difficult than is one of service and practical considerations must govern the extent to which such a survey could be carried. For the present purpose, however, only broad classes of traffic need to be distinguished and only those classes which are important in given areas need to be considered. Differences in the costs of common carrier motor service, on the one hand, and of contract, private, and "exempt" service, on the other, must, however, be reckoned with, as must, obviously, certain basic differences in the character of rail and motor costs. There must also be a determination of the kinds of costs to be developed. It seems likely that users of cost data would find most advantage in having a "build up" from "out-of-pocket" costs to "full allocated costs." Practical considerations must, of course, govern how far a survey of the broad type described could be carried.

Table 9 and the tabulation which follows indicate some of the more important differences in the characteristics of rail and motor transportation which bear on costs.

Railroads with their large investment in fixed facilities are, of course, conducting operations on a much larger and more diversified scale than are motor carriers. In 1940, the average "road unit" transported slightly less than 50 cars and about 850 tons of freight.

TABLE 9.—*Comparison of Distribution of Motor Carrier and Railroad Investment in Operating Property and of Expenses and Other Deductions From Income in Relation to Operating Revenues* [1]

A. APPROXIMATE RELATIVE DISTRIBUTION OF INVESTMENT

Element	Motor carriers		Railroads
	Property	Passengers	
Facility over which operations conducted			66.3
Structures and other more or less fixed facilities	19.0	18.8	14.2
Equipment:			
Freight	81.0		17.4
Passenger		81.2	2.1
Total	81.0	81.2	19.5
	100.0	100.0	100.0

B. PERCENT OF OPERATING REVENUE REPRESENTED BY BROAD EXPENSE GROUPS AND BY OTHER DEDUCTIONS FROM INCOME

Equipment and shop	12.7	14.2	14.5
Transportation	29.9	24.8	20.0
Station or terminal	15.3	7.9	15.3
Traffic, solicitation and advertising	3.3	3.8	2.7
Insurance and safety expense	5.7	4.5	1.4
Administrative and general	10.1	6.5	3.7
Facility over which operations conducted	[2] 5.7	[2] 7.4	10.4
Depreciation:			
Equipment	5.2	8.1	4.9
Other	.4	.6	.2
Total	5.6	8.7	5.1
Interest on long-term obligations	.3	.7	12.9
Taxes (including income taxes)	2.8	5.9	8.9

[1] The material shown is based on 1939 data and in the case of motor carriers relates to Class I carriers. The groupings by "element" are governed by available statistical material and in some cases are approximate and subject to some qualification. However, the space available does not permit of detailed discussion.
[2] Motor vehicle taxes.

Element	Motor carriers [1]		Railroads
	Property	Passenger	
Total investment (gross):			
Per power unit [2]	$3,699	$12,363	$474,518
Per employee	1,579	4,018	20,424
Revenue:			
Per power unit [2]	8,650	17,640	93,976
Per employee	3,692	5,608	4,045
Per dollar of gross investment	2.34	1.40	.20

[1] Class I.
[2] In the case of predominantly intercity motor carriers of property, the total number of trucks and tractors (including equipment used predominately in local service); of predominantly intercity motor carriers of passengers, the total number of busses; and of Class I line-haul railroads, the total number of locomotives. See also footnote 1 of Table 9.

The average load per road unit in the motor carrier field probably does not exceed 6 tons. Considering the many differences between the two forms of transportation, effective utilization of aggregate carrying capacity is considerably greater, however, in the motor field.

The railroads, having a high proportion of their investment in fixed property, much of which, because of its highly specialized nature, cannot be used for any other purpose, are in a very difficult position in the event of declining business. On the other hand, motor vehicles under similar circumstances can, as a rule, be placed on more profitable routes or sold, or operations can be abandoned with relatively small loss. Also, motor vehicles have a much shorter life than rail equipment. Further, the terminal facilities of motor carriers of property as a rule are not so specialized that they cannot be converted to other uses, though this condition is becoming less general as carriers provide themselves with modern facilities.

These differences in the investment of rail and motor carriers necessarily have an important bearing on the distribution of operating expenses and other costs, as shown in section B of Table 9. The principal difference lies in the item of interest on long-term obligations (12.9 percent of rail revenues in 1939 and 0.3 percent of truck revenues). Indebtedness of this kind in the case of motor carriers is accounted for to a considerable extent by carrying charges on equipment. Taxes for the support of the general functions of government in the rail field also absorb a greater part of revenues, owing in considerable degree to the much greater relative investment required. The cost of maintaining the "facility over which operations conducted" is much higher in the rail field than in the highway field, although the data with respect to this item in Table 9 are subject to some qualification.

The so-called variable costs cannot be definitely isolated in Table 9. They are, however, clearly of greater relative importance in the case of motor carrier operations than in the rail field.[74] In fact, with many of the smaller common carriers and with contract carriers, the bulk of all costs is variable because of the absence of terminal or overhead costs, except as equipment on hand at a given time is used to less than its capacity.

The higher proportion of variable costs in the motor carrier field necessarily causes some difference in the performance of costs as compared with that of rail costs. With a given increase in the volume of business (assuming a reasonable degree of utilization of existing equipment), a motor carrier must acquire additional equipment, with the result that there is only a slight reduction in unit costs.[75] On the other hand, rail carriers, with a heavy proportion of fixed costs and a facility (other than equipment) almost always capable of a much higher degree of utilization, can reduce unit costs substantially with an increase in tonnage. Also, the greater importance of rail terminal costs, to a considerable extent fixed in character, results in a cost advantage to the motor carrier up to the length of haul at which the lower terminal costs of the motor carrier are offset by the more favorable line-haul costs of the rail carriers.[76]

An indirect and partial indication of the relative costs associated with the various types of motor carrier operations and by broad size groups is provided by the revenue data given in Table 10. The range, from $8.31 per ton for regular-route common carriers of general commodities to $2.54 for regular-route contract carriers of special commodities, is explained in large part by the expensive terminal operations of the first group, necessitated by the handling of numerous small shipments, as contrasted with the generally large shipments handled by contract carriers from and to facilities and often with loading and unloading services provided by shipper and consignee. Differences in value of commodities transported also enter in, of course, as do differences in average lengths of haul. The revenue received per ton by the smaller carriers of general commodities is less than that of the Class I carriers, owing, for the most part, to shorter average hauls. The reverse appears to be generally true in the case of special commodities. However, in this instance there may also be differences in the class of freight carried.

TABLE 10.—*Revenue Per Ton of Freight, Predominantly Intercity Motor Carriers of Property, by Class of Operation, 1939*

Class of operation	Class I	Class II and III	Total
General commodities:			
Regular route—			
Common	$8.31	$6.44	$7.77
Contract	5.82	5.41	5.77
Irregular route—			
Common	5.48	4.28	4.56
Contract	5.29	3.87	4.94
Special commodities:			
Regular route—			
Common	4.86	5.10	5.01
Contract	2.54	5.53	3.73
Irregular route—			
Common	6.80	4.68	5.11
Contract	3.13	4.42	3.84
Total	6.68	4.98	5.79

[74] Variable costs, in distinction from fixed or constant costs, are those which change as the volume of business changes.

[75] Federal Coordinator of Transportation, *Freight Traffic Report*, vol. III, p. 154, indicated that in 1932 in the neighborhood of 80 percent of the total cost is directly associated with the operation of the vehicle. Under some conditions, carriers could achieve lower costs by using larger equipment.

[76] Although the situation today is not the same as it was in 1932, the findings in the statement of the Federal Coordinator of Transportation, *Merchandise Traffic Report*, are of interest. See, for example, p. 16.

As noted earlier, average revenue per ton-mile or ton of rail freight is not comparable with that of motor carriers, owing to differences in class of freight and in length of haul. In 1939 all railroads had revenue of $3.45 per ton and of 0.983 cent per ton-mile. However, revenue per ton of less-than-carload freight was $16.96. Except for differences in the length of haul, and possibly some difference in size of shipments, this amount may generally be compared with the revenue shown in Table 10 for common carriers by motor vehicle engaged in transporting general commodities.

Different characteristics of vehicle utilization are to be noted in the various classes of motor vehicle operation. Some of these differences are explained by the class of operation and others by the size of carrier. Thus, in local operations the use of the vehicle is confined largely to daylight hours, annual mileage is small, the equipment is generally a single-unit truck of much smaller capacity than that of the intercity vehicle, and utilization of available cargo space is generally low. In intercity operations a much greater proportion of total use is at night, annual mileages are quite large (around 50,000 miles per year), the equipment type is more generally a tractor-semitrailer, and utilization of available cargo space is, except for certain operations, much greater than in the case of local operations.

Common carriers, as a rule, operate smaller equipment with lighter average loads than do contract carriers. However, since contract carriers are predominantly engaged in transporting special commodities, a large amount of empty back-haul mileage is necessary.

Small carriers [77] are generally operating over shorter distances, use smaller and lighter equipment and more single-unit trucks,[78] carry smaller loads, operate their vehicles fewer miles per year, and have a greater proportion of empty mileage. As a result, their cost per ton-mile is greater than that of the larger carriers. Special commodity carriers as a rule have a less balanced haul than do general commodity carriers. In many cases this difference results from the use of specialized equipment, such as petroleum tank trunks, on which a return load ordinarily can not be carried.

Application of Results of Service and Cost Surveys

There are two basically different conditions under which motor transportation can be rendered. One requires the maintenance of independent motor carriers, able to deal at arm's length with the railroads and to follow courses of action in keeping with what are considered the attributes of motor transportation. The other is that in which the major carrier—the railroad—is granted the right to take over motor operations for use in conjunction with rail services and otherwise. Needless to say, motor transportation would find substantially different fields of service under the latter than under the first basis.

From the broad public standpoint, the objective under either basis would be to let strength or efficiency prevail and to eliminate weaknesses. Insofar as either form of transportation finds itself doing things which the other can do better or which can be done best through a joining of services, there must be a give-and-take attitude and a willingness to cooperate if achievement is to be had by voluntary means. It goes without saying, however, that the relations of rail and motor transportation are such that adjustments must be wrought out for the most part through the play of competition rather than through a concerted plan of action. The reasons are purely business ones whose general nature is readily understood.[79] It is necessary, therefore, for the Government itself to take such steps as it may to resolve these problems in the public interest. On the whole, adjustments must continue to be made on a piecemeal basis and in accordance with principles developed as specific issues are considered.

The Commission passes on issues of this kind in its control of entrance into or extension of motor operations, in its control of the purchase or other acquisition of existing operations, and in its regulation of competitive rates.

The Commission generally permits the institution of motor operations despite showings as to the existence of rail service and as to the effects of motor operations on the continuance of such service. The reason lies in the disadvantages attaching to the use of the railroads. Shippers are held to be entitled to the ad-

[77] See *Federal Regulation of the Size and Weight of Motor Vehicles*, *op. cit.*, Table D-9 and pp. 612–614, for a discussion of differences with size of carrier.

[78] *Ibid.*, Table 10, p. 116.

[79] At one time lack of responsibility on the part of motor carriers and the spotty character of their services were legitimate reasons for the railroads to refuse to enter into through routes and joint rates with them. Until some time after the passage of the Motor Carrier Act, 1935, motor carriers also were generally opposed to such arrangements. Now, with rail-motor rates (other than those with a railroad's own subsidiary) still so few as to be practically negligible (*Traffic World*, September 13, 1941, p. 652), and with motor carriers, at least when faced with an expansion of rail use of motor vehicles, desirous of joint rates, the railroads urge that use of such rates would lead to lack of unity of interest and common management required to achieve good service at the lowest possible costs, and to dependence on motor carriers who are themselves engaged in services competitive with the railroads and therefore to the eventual elimination of the latter's services, as, among other ways, through disclosure of information as to traffic to a natural competitor. (See *Kansas City Southern Transport Co., Inc., Common Carrier Application*, 28 M. C. C. 5, 16–21 (1941). The Commission accepted some of the reasons cited. In other and perhaps many instances, truck operators are of no mind to join in rates with the railroads even if the railroads were willing. There are also the important considerations that rail entrance into over-the-road motor transport operations is expressly limited by law, that more and more uses of motor transportation are desired by the railroads, and that motor carriers resist rail entrance into motor transportation.

vantages in the way of speed, shipment in small lots, etc., which motor carriers can give.[80]

Railroad engagements in or acquisitions of motor operations effected prior to Federal regulation [81] could not be disturbed by the Commission. All subsequent new operations or acquisitions have been with the Commission's approval. In the case of railroad entrance into motor operations, approval is conditioned in such a way as to require that the motor services be auxiliary to, or supplementary of, rail service, in the sense that the traffic carried generally must have a prior or subsequent rail movement. However, this condition is relaxed under appropriate circumstances.[82] In cases involving the acquisition of existing motor carriers, the Commission commonly requires exclusion of all irregular-route rights proposed to be acquired and all rights to render service from or to, or to interchange traffic at, any point which is not a station on the railroad if such point is more than 10 miles by highway from such a station.[83] Again there are exceptions. Railroad use of line-haul motor transportation is therefore somewhat circumscribed, as required by the act, though substantial opportunities are afforded to link the two forms of transportation into a coordinated service. There is no ban on railroad operation of motor vehicles in terminal areas.

The growth of railroad interests in motor freight transport operations can be traced quite accurately.[84] It has been marked, but less, relatively, than in the passenger field. A detailed field analysis of what these operations are accomplishing for the railroads and the public would be highly beneficial for the light it would throw on the question: Should legislation be enacted which will permit of wider and freer use of motor transport by the railroads?

At the outset, the rates of motor carriers were at or above the rail level. Shippers often paid a premium for a much needed and superior service. Many continued for a long time thereafter to pay particular carriers rates intended to assure a high type of individualized and responsible service. Shipper pressure on carriers, the furnishing of service over longer distances, creating greater need for return loads, severe competition between the motor carriers themselves induced by these and other conditions, and reductions of costs as equipment and roads were improved and fuel costs declined, forced motor carrier rates and charges, both common and contract, down to levels often substantially below those of rail rates. The latter rates were reduced in turn and further reductions of motor rates were thereupon set in motion. When Federal regulation entered the picture and carriers were required to file their tariffs and charges, a condition of near panic was created, particularly in the case of common carriers, whose rates were to become definitely and generally known for the first time in many instances and were no longer to be subject to change at the volition of the carriers. A downward movement of rates occurred at this time, inasmuch as no carrier wished to be left with a set of rates above those of his competitors. Not knowing with any degree of certainty what rates their competitors would file, given carriers cut below what was necessary to accomplish their purpose.[85] The Commission, recognizing the existence of an emergency condition created by depressed rates and rising costs, subsequently placed blanket minimum rate orders in effect in certain areas.[86] These orders put a stop to disorderly rate cutting and gave financial relief to the carriers.

The rates so prescribed generally reflected the prevailing position of motor carriers that their rates should be substantially equivalent to the existing rail rates and premised on a classification similar in its structure to that of the railroads. In other words, these rate adjustments bore no necessary relation to the costs of performing particular classes of motor service,[87] or to the relative service advantages of motor and rail transportation, but were intended to cover costs in the aggregate. The conditions under which these

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[80] A recent examiner's report, *Super Oil Company Common Carrier Application*, (No. MC-101075), poses at some length the question of the public interest in the protection of rail service, particularly that on branch lines.

For simplicity, this discussion passes over questions relating to the relative advantages of one or another form of motor transportation. See, for example, *Lon D. Fisher Common Carrier Application—New Operation*, 30 M. C. C. 217 (1941).

[81] See Federal Coordinator of Transportation, *Regulation of Transportation Agencies*, op. cit., pp. 265–324.

[82] See *Kansas City Southern Transport Co., Common Carrier Application*, 28 M. C. C. 5 (1941). Other exceptions are, for example, those in which an operation beyond a railroad's lines effects a desirable short cut or the furnishing or improvement of service to territories of low traffic density.

[83] The leading case is *Pennsylvania Truck Lines, Inc.—Control—Barker M. Frt.*, 1 M. C. C. 101 (1936), 5 M. C. C. 9 (1937). A review of the Commission's decisions is found in John F. Meck, Jr., and Robert W. Bogue, "Federal Regulation of Motor Carrier Unification," 50 *Yale Law Jour.*, 1408–1418 (1941).

[84] See Motor Bus and Motor Truck Operations, 140 I. C. C. 685, 755–759 (data as of 1926) *Coordination of Motor Transportation*, 182 I. C. C. 263, 393–400 (as of 1930) Federal Coordinator of Transportation, *Regulation of Transportation Agencies* (as of 1933), Interstate Commerce Commission, *Investment of Steam Railways in Highway Motor Vehicle Enterprises as of May 1, 1935* (Statement No. 3669), *Highway Motor Vehicle Enterprises in Which Steam Railways Had a Financial Interest as of Dec. 31, 1930, and Dec. 31, 1935.* (Statement No. 4140.)

[85] The foregoing statement is drawn in part from the Commission's *50th Annual Report*, 1936, pp. 73–74.

[86] See footnote 27.

[87] The rail rates, in turn, reflect many compromises with costs, including those resulting from efforts in the past to place a relatively heavy burden on short-haul traffic in order that a lesser burden might be borne by long-haul traffic. It is also to be noted that groups of rates, both motor and rail, must reflect average conditions to a large extent. Cf. *Central Territory Motor Carrier Rates*, 8 M. C. C. 233, 249–250 (1938).

changes were made precluded, of course, detailed adjustments for this or any other purpose. Numerous supplementary decisions have been rendered, some of which have had the effect of bringing particular rates into line with the costs of specific motor services.

There have been many other decisions not tied in with a Commission adjustment of rates in a large territory, which reflect a piecemeal process of fitting rates to carriers' aptitudes and an effort to bring about sound economic conditions in motor transportation and in transportation generally. In a typical case of this kind a carrier presents a statement of its truck-hole or ton-mile costs and of the revenues the proposed rate would produce. If, as is generally the case, the proposed change represents a reduction of existing rates, other motor carriers may protest on the ground that the proposed rate is noncompensatory, will break down the rate structure in the territory involved, or will result in needless sacrifice of revenue. The railroads commonly also appear as protestants and advance generally similar arguments.[illegible] Shippers sometimes appear as protestants, though more generally their interest is aroused if an advance in rates is proposed. Questions of discrimination, market competition, rate-making distances, etc., are presented. These questions are in most respects similar to those long encountered in fixing of railroad rates. The effects of private or "exempt" transportation must also be considered in many instances. Many rate proposals have been rejected because of failure of the carriers to demonstrate that they would cover the attendant cost or of the absence of any convincing cost testimony. These decisions in turn influence future proposals of carriers generally, with the result that a very substantial amount of influence has been exerted in the direction of placing motor rates on a cost basis. These cases are all comparatively simple ones and do not involve a basic survey of the problem of adjusting and relating motor and rail rates in ways intended to promote the public interest.

Mention may now be made of a few cases which illustrate particular problems of broad interest.

One is *Refrigerator Material Memphis Tenn. to Dayton, Ohio*, 4 M. C. C. 187 (1938), in which the Commission ruled against the use of rates based on out-of-pocket costs, with certain exceptions, and pointed out the special dangers in such a basis in the case of motor carriers.[illegible]

Gasoline from San Francisco Bay Points to Ogden, Utah, 229 I. C. C. 33 (1938), presented the issue of whether severe reductions in rail rates could be allowed to meet greatly increased truck competition, considering, among other matters, the effects on a general rail rate structure found to be "a reasonable, interrelated, and harmonious whole" and probable aggregate net revenue losses for the railroads as a whole. However, in a related proceeding,[illegible] the Commission required an increase in the competitive truck rates. It held that, in view of the volume and importance of the traffic in question to the motor carrier, it

> would hardly be justified in prescribing rates so high as to preclude it from competing for the traffic on an even basis with the rail carriers. * * * leaving each free to compete on the basis of the merits of their respective service.

In *Naval Stores from Mississippi to Gulf Ports*, 235 I. C. C. 723 (1940), the railroads, who had suffered a heavy loss of this class of traffic, proposed further reductions of their rates, with an increase in carload minima, in order to meet truck competition and to effect certain equalizations of railroads and ports. The evidence indicated the superiority of motor service and that the proposed rail rates and existing motor rates were compensatory and otherwise lawful. In reaching this conclusion the Commission said:

> Healthy competition between different agencies of transportation is undoubtedly in the public interest. Ordinarily either may initiate rates that will in the opinion of its management enable it to obtain or retain desired traffic provided that such rates are compensatory and do not cast a burden upon other traffic. It is manifest, however, that when, because of an insufficient volume of traffic or for any other reason, competition is carried to the point where the service clearly is being performed at a loss, public interest is not being served.

Conditions of "ruinous competition" were lacking in this instance, though "keen competition" was found to exist.[illegible]

Petroleum Between Washington, Oregon, Idaho, Montana, 234 I. C. C. 609 (1939), stated more definitely the principle that reductions in rates should not be carried beyond the point necessary to meet competition and that the public interest requires in given instances the maintenance of competitive services, without de-

[illegible]

[illegible] *Stones, Alabama and Tennessee to Interstate Points*, [illegible] (1938), and *Onions and Potatoes from North Dakota to Twin Cities*, 26 M. C. C. [illegible] (1940), are discussed [illegible] *Leather from Middleboro, Ky. to Chicago, Ill.*, 18 M. C. C. 265, 268 (1939).

[illegible] *Bamberger Electric R. Co. v. Lane Transp. Corp.*, 8 M. C. C. 200 (1938).

[illegible]

[illegible] transportation, even if showing the form of transportation is regulated, charge rates which would yield "some margin over the costs."[illegible]

Possibly the most concrete presentation of the issues is provided by *Permian and Permian Pipelines, Inc. v. [illegible]*, 251 F. C. C. [illegible] (1943). Here the motor rates of the consolidated traffic had come to substantially the same level. Rates significantly per unit for larger, but more significant and more [illegible] is greater. As in most instances, motor rates were substantially higher than rail rates. Motor carriers argued that their rates were low in order to induce continued consumption and argued that the rates of related pipelines should be increased to a level to yield [illegible] motor carriers would continue to afford the consumers some measure of the public interest. The railroads argued, in turn, that protection of a high-cost agency in this manner would impair their ability to the benefits of their natural advantages and be unfavorable. The complainants desired the protection of both forms of transportation but some advocated that some increase in rail rates. Several witnesses [illegible] and [illegible] increase.

The rail rates in question were found to be low in terms of other comparable rates but "[illegible] the rates which we ordinarily employ." Also, the "[illegible] that reasonable minimum rates." The Commission established that existing motor rates were [illegible] lower than fair rates. Higher rates were not prescribed, however, as such rates would impair the revenue of traffic under most conditions. Minor changes were left in effect, in the position of having no notice that rates or for the time not [illegible] from the traffic.

Another phase of the "[illegible]" question has been [illegible] in the recent decision in *New England Rate Fixing, Inc. v. [illegible]*, [illegible] M. C. C. [illegible] (1944). Here the Commission, [illegible] *[illegible] v. [illegible]*, [illegible] M. C. C. [illegible] (1939), [illegible] a minimum charge should not be required. [illegible] the rates [illegible] to prevent the unfavorable advantages of competitive [illegible] by charging minimum-charge rates in [illegible].

The rates which are [illegible] by the [illegible] offers [illegible] of the [illegible] [illegible] in the [illegible] of introducing the [illegible] advantages of rail and motor transportation." It is [illegible] that a [illegible] rate [illegible] [illegible] of this [illegible] [illegible].

[illegible]

[illegible]

Problems Common to Carriers of Passengers

[illegible] of the industry to [illegible].—The bus industry has not been subjected to the [illegible] of the railroads to the extent that the truck industry has. The reason is in part its smaller size and in part the greater national interest in bus than in truck operations. The industry however, sought Federal regulation for several years prior to 1935. Such regulation was somewhat more effective, and the industry has expanded to two hundred times its greater extent. Long hours and low wages were substantially less common, and some [illegible] in these respects are not [illegible] figures per bus.[illegible]

There also is no increase in the industry in the same way as it increases beyond its greater sales in that it expresses it a substantial degree a competitive duplication of service which has advantage to the public. The railroads provide high-speed rail traffic [illegible] the bus using well-[illegible] greater speed to the passenger car. This management has been progressive and the railroads [illegible] have shown a [illegible] in bus operations have shown [illegible].

Leasing of equipment, routes and services.—Leasing practices are not a particularly important problem in this field.[illegible]

Organization for common action.—The interest bus industry has had a national organization since 1926.[illegible] It is a trade similar organization that has come to the [illegible] head. A related organization, the National Bus Traffic Association, now is the sole [illegible] and rate agency for the industry, in contrast to the numerous such agencies created by the carriers of the same field.

The rental and subsidiary [illegible] of the industry also has had a national organization. [illegible] [illegible] [illegible] [illegible], which is necessary when back haul [illegible].

[illegible] of the [illegible] in motor

[illegible]

[illegible]

[illegible]

bus transportation.—It may almost be said that there is no problem of the kind suggested by this heading. As just stated, no issue is raised by the railroads as to the field of service occupied by the bus. In fact, the showing of the bus would be better than that of the railroads if the issue were to be raised, owing to the contrast that exists between a self-supporting bus industry and a rail passenger service which generally is a drain on freight revenues. However, barring the effect of competitive wastes, the deficits on rail passenger operations are not necessarily a ground for criticism. An important public service is rendered at a price which generally cannot be made remunerative. This situation serves to emphasize the view that relative costs alone can not be the controlling factor in adjusting the relations of competing agencies of transportation.

If a comparison of aptitudes were to be undertaken, however, it would be less difficult than that suggested in the case of property transportation.[98]

A problem respecting the maintenance of an independent or a rail-dominated bus industry arises here as it does in the case of property transportation. However, conditions are strikingly different. The railroads developed substantial interests in bus transportation before they did in the property field[99] and may be said, in fact, to be a major factor in passenger transportation over the highways. There has been a greater degree of coordinated use of facilities, as well as coordination of services. As in the property field, smaller operators often serve in a feeder capacity. As a rule, only certain larger independent bus operations cause the railroads to assume an attitude of aloofness, such as is found in the property field. Some persons urge, with respect to particular sections of the country, that the railroads have too strong a grip on passenger transportation. The Commission has had various issues of this kind presented to it.

The implementing of "inherent advantages" through rate adjustments has been largely left to the carriers. The Commission has forced certain downward adjustments on the rail carriers in the eastern district, on the theory that lower rates would increase net revenue and help to lessen the drain on rail revenues. This step may not have been an implementing of aptitudes, except in the sense that, with a very large volume of fixed costs, a lower scale of rates would enable the maximum possible degree of utilization of facilities and personnel. For the most part, the bus industry follows the railroad lead but maintains a differential under rail rates to offset the net disadvantages of bus transportation.

A number of interesting and important problems have not been considered in this paper. One relates to the vital part the motor transport industry is playing in the war program and to the possible effects on the industry of the aftermath of this program. Equipment is being purchased to the limits of the producer's ability to supply it. The surplus that may remain when demand falls off is not likely, however, to prove a source of difficulty for long, as normal retirements of aged equipment are not occurring at present. The trucking industry is being charged with "getting rid of the less-desirable traffic, and especially [with] strengthening [its] hold on profitable tonnage which will continue to move when the present crisis has passed."[1] Some foresee very severe competition provided by the transportation of freight in left-over planes or in planes especially designed for this purpose. Also, a certain amount of fear is expressed that the industry will be jeopardized by government operation of railroads, should that come about.[2]

[98] Service could be compared on the basis of speed, frequency, convenience of stations and schedules, and comfort and safety. The relative distances traveled by passengers using the two forms of transportation in itself would go far toward revealing relative service aptitudes. It would be necessary, however, to examine the travel habits of users of passenger cars and the costs of such transportation. Also, the problem of cost finding in the rail and bus field is not as formidable as it is in the property field.

The *Passenger Traffic Report* of the Federal Coordinator of Transportation furnishes many valuable leads and some data which can still be used.

[99] See sources cited in footnote 84

[1] 111 *Railway Age*, 696 (1941).

[2] See address of Ted V. Rodgers, President, American Trucking Association, Inc., at the 1941 convention of the Association, 16 *Transport Topics* 26 (Nov. 3, 1941).

PART II—SECTION IV
INLAND WATER TRANSPORT

Prepared Under the Direction of Julian L. Schley[1]

In the current maze of conflicting ideas about transportation it is difficult to find a universally acceptable basis for appraising the particular role of inland waterways. This study recognizes transportation as but one of the three interdependent activities that constitute business, none of which can be successfully singled out and made profitable at the expense of the other two. Although waterways as yet carry only a small part of domestic commerce, the rapid growth of water-borne traffic has given rise to a disproportionate amount of controversy. Discussion centers not only on the comparative efficiency and economy of water transportation and the relative importance of navigation among the purposes for which national water resources are developed, but even more on the principle of public aid and its impact on other carrier agencies. The purpose of this chapter is not so much to debate the principles of public policy as to marshal the facts available to the War Department to show whether inland water transportation can be made sufficiently economical and efficient to justify the whole cost.

Inland waterways are not physically indispensable because, if economy is disregarded, other agencies can be expanded to perform equivalent service. As funds for providing Federal navigation improvements come out of the public purse, it is obvious that inland waterways and water carriers must fill some definite public need to justify continued encouragement and protection by the National Government. Opponents of improvements for navigation maintain that when expenditures for public aid are added to the cost of water carrier service the resulting total expense exceeds in many cases the average cost of privately financed transportation in similar service. It will become more clearly evident as this analysis proceeds that the comparative economic showing made by inland water transportation depends altogether upon the soundness of the method of appraisal selected.

In the pages that follow an attempt is made to rationalize the inherent characteristics that set inland waterways and water carriers apart from other agencies of transport; to show how they became what they are; to follow the procedure of the Army Engineers in determining the economic soundness of proposals for river and harbor improvements and in carrying out the projects authorized by Congress; to find why inland water-borne tonnage continued to increase during the years when traffic as a whole was falling off; and to find why waterways and water carriers in the aggregate, even with these gains, have not yet developed the volume of commerce for which they were designed. The extensive use and great value of improved inland waterways for passenger traffic for business, health, and recreation is recognized, but that function is not discussed in the limited space here available because it is not considered a vital factor in the present transportation problem. The almost infinite diversity in size and types of water channels and water craft, as well as the variety of uses to which they are put, makes it impracticable to generalize with any degree of accuracy. However, with full appreciation of the difficulties, it is undertaken in this chapter to define a sound, fair basis for appraising inland waterway transportation with all its contingent costs and disadvantages in terms of public value.

Inland Waterway Improvements

Historical Background

The first white men on this continent settled in the network of broad estuaries of the rivers that came from the interior. Their descendants utilized these waterways to penetrate and settle the mid-continental area of the country. Transportation of heavy freight over the unimproved waterways was hazardous and expensive and eventually improvement of the natural watercourses was made; first by the marking of the most dangerous rocks and snags and later by the removal of the obstructions. Then came the toll canals, most of which were State enterprises operated by mule power. Transportation on them was more efficient than on the wagon roads of the period, but was slow and beset by many difficulties. Although they were not in themselves financially successful, they performed an important service in building up the country and its commerce.

Federal appropriations for the improvement of natural waterways expanded from 1826 to 1866, and up to about 1850 a large proportion of the transportation of the country was carried on inland waterways. Then, with the development of the railroads the canals steadily lost ground. A growing demand from in-

[1] Major General, Chief of Engineers United States Army.

dustry and agriculture for a cheaper means of transportation gave impetus to a revival of interest in waterway improvement and in 1907 resulted in the creation of the Inland Waterways Commission. The Federal Government embarked on the modified canalization project on the Ohio River, marking the beginning of the modern standard system of interconnected waterways serving the entire intermountain section of the country. However, it must not be supposed that these transitions took place without opposition. Progressive innovations in this field of endeavor have always had to overcome the formidable resistance of the firmly established forms before attaining full development.

Adaptability of the Rivers to Navigation

Both geographically and in their physical characteristics, the rivers of the United States are admirably suited to the uses of a progressive population. The great river system draining the Mississippi Valley, with its headwaters separated on the north only by insignificant natural barriers from the most extensive chain of navigable lakes in the world, furnishes the basis for the development of an inland navigation system of unexampled extent and utility in time of peace and of incalculable value in the event of war.

For the most part the main streams and tributaries flow through gently sloping valleys and plains, uninterrupted by cataracts and rapids which would make their improvement difficult or prohibitive. Independent river systems of the Atlantic and Gulf coasts, although not so long, and more prolific in power sites in their upper reaches, partake of the same characteristics as the Mississippi. They are connected at their mouths by a series of tidal bays and sounds that require but little dredging to form a continuous sheltered navigable waterway from the port of Boston to the Mexican border. Even the rugged Pacific slope is not without its navigable river courses which find their way through the ridges from the fertile valleys beyond. On practically all these inland and coastal rivers slackwater systems can be installed where needed at relatively small expense. Reservoir sites are available on the upper reaches for supplementing and regulating the natural run-off from a generally adequate and well-distributed annual rainfall. The main stem of the inland system is already connected by the Illinois Waterway to the Great Lakes. The New York State Barge Canal and the Hudson River afford a connection with the Intracoastal Waterway located parallel to the Atlantic and Gulf coasts.

Entering the main trunk of the Mississippi River System from the northwest is the Missouri, 2,240 miles long. From the northeast the Ohio flows 981 miles from the confluence of the Allegheny and Monongahela at Pittsburgh to join the Mississippi at Cairo, Ill. The Tennessee, itself a stream now being canalized for the entire 650 miles below the confluence of its headwaters, the Holston and the French Broad, joins the Ohio from the south at Paducah, Ky., 47 miles above Cairo. The divide between the Ohio River and the Great Lakes is narrow and low enough to present no serious obstacle to a second navigable connection between the river and lake systems. Four hundred miles below Cairo, the Arkansas enters the Mississippi from the west. Connecting from the east at New Orleans by the intracoastal canal is the Warrior-Tombigbee System and the Apalachicola System of the eastern Gulf slope. All of these rivers together drain practically half of the continental area of the United States, containing half the population of the country and far more than half of its natural resources. With no great difficulty this river system can be further improved to serve the greater part of that area by interconnected waterways of higher standards in limiting dimensions, facilities, and equipment than the newest and most renowned of the European waterways and at a lower cost per mile.

Progress of Inland Waterway Development

Following a plan of development continuously revised and modified to keep it abreast of the ever-changing needs of the country, nearly 28,000 miles of these inland waterways have been improved. Without qualification, however, that figure would be misleading because it includes the most ambitious canalization projects on the principal rivers along with others of ever lessening importance, down to the many small isolated projects involving merely the periodic removal of snags and overhanging trees and the provision of seasonal navigation for flatboats and rafts. Because of such wide differences in types, sizes, and uses of these channels, it is impracticable to make accurate general statements applying to them all. Of the total 27,933 miles of improved waterways (table 1), which includes the natural channels of the Great Lakes, about 9,200 miles have been improved to an authorized project depth of 9 feet or greater. Approximately 6,000 miles includes rivers and canals (the Mississippi and Tombigbee-Warrior Systems) which comprise the interconnected inland waterway system upon which regular barge-line service is firmly enough established to be a factor in domestic transportation. In addition there are about 3,000 miles of 12-foot depth and over, that for the most part constitute natural channels in the coastal rivers which serve special territories and classes of traffic of little consequence from a standpoint of active com-

TABLE 1.—*Navigable Lengths and Existing Project Depths of Principal Inland Waterways of the United States*

Names of rivers or waterway systems	Length in miles of waterways				Total mileage
	Under 6 feet	6 feet and under 9 feet	9 feet and under 12 feet	12 feet and over	
Atlantic Coast:					
Connecticut River, Conn				85	85
Hudson River and New York Barge Canal				670	670
Delaware River (above Philadelphia)				32	32
Potomac River, Md				108	108
Rappahannock River, Va				107	107
York River, Va				41	41
James River, Va				91	91
Neuse River, N. C	150			34	184
Cape Fear River, N. C		115		30	145
Waccamaw River, N. C. and S. C	26			44	70
Savannah River, Ga		199		30	229
St. Johns River, Fla	25	90		83	198
All other rivers	2,269	622	539	444	3,874
Total, Atlantic Coast	2,470	1,026	539	1,799	5,834
Mississippi Valley:					
Mississippi River (Soo Railway Bridge, Minneapolis to the Gulf)			1,586	226	1,812
Illinois River and Waterway			327		327
Missouri River (Fort Benton to mouth)	1,474	767			2,241
Ohio River			981		981
Monongahela River, Pa., and W. Va		37	91		128
Allegheny River, Pa	153		72		225
Kanawha River, W. Va	6		91		97
Kentucky River, Ky		263			263
Cumberland River, Ky. and Tenn	3	523			526
Tennessee River, Tenn., Ala., and Ky			648		648
Arkansas River, Ark. and Okla	373				373
Ouachita and Black Rivers, Ark. and La	67	351			418
Yazoo River, Miss	189				189
Other Mississippi River tributaries	3,103	727	15		3,845
Total, Mississippi Valley	5,368	2,668	3,811	226	12,073
Gulf Coast:					
Tombigbee-Warrior System			472		472
Withlacoochee River, Fla	85		4		89
Caloosahatchee River and Lake Okeechobee Drainage Canals, Fla		133	16	4	153
Bayou Teche, La		107			107
Other rivers	2,644	370	145	20	3,179
Total, Gulf Coast	2,729	610	637	24	4,000
Intracoastal Waterways:					
Atlantic Coast	435		21	920	1,376
Gulf Coast			877	55	932
Total, intracoastal	435		898	975	2,308
Great Lakes and Connecting Channels				1,479	1,479
St. Lawrence River to Canadian Boundary				62	62
Total, Great Lakes System				1,541	1,541
Pacific Coast:					
San Joaquin River, Calif	83		2	41	126
Sacramento River, Calif	102	85	59		246
Coos River, Oreg	23			11	34
Columbia River, Oreg				118	118
Columbia River between Vancouver, Wash., and Bonneville, Oreg				39	39
Columbia River above Celilo Falls, Oreg. and Wash		123			123
Willamette River, Oreg	132			12	144
Snake River, Oreg., Wash., and Idaho	232				232
All other rivers	231	48	36	1	316
Total, Pacific	803	256	97	222	1,378
All other waterways (miscellaneous)	260	539			799
Grand total	12,065	5,099	5,982	4,787	27,933

petition with overland carriers. The balance of the mileage of improved waterways shown in this table is of varying depths of less than 9 feet, down to the relatively unimportant projects mentioned above whose maintenance consists merely of the removal of snags.

Present Public Policy and Administration

In the earliest day of the nation's history, when transportation dealt with the meager requirements of but a few families in each locality, the waterways as nature had made them were adequate and open to all and no question of improvement or regulation arose. As commerce grew, however, various interests came into conflict and attempts were made by both the States and private interests to assert and establish control over certain waterways.

The first definite expression of public policy with regard to the inland waterways was contained in Article 4 of the Ordinance of 1787 for the government of Northwest Territory, which provided that:

> The navigable waterways leading into the Mississippi and St. Lawrence, and the carrying places between the same, shall be common highways, and forever free, as well to the inhabitants of the said territory as to the citizens of the United States, and those of any other States that may be admitted into the confederacy, without any tax, impost, or duty therefor.

This policy requiring all navigable waterways to be free from tolls and unrestricted in use to all has since been maintained by the Federal Government. It is true that tolls were assessed on some of the early canals, but these were originally improved as local enterprises on a tolls basis. Federal improvements have always been free with one exception—the Panama Canal—and in this case the tolls-free provision in the Act of 1912 was repealed by the Act of 1914 because of protest by the British Government and not for the purpose of obtaining revenues.

Although the Constitution vested in Congress the power to regulate commerce "among the several States," for many years opinions clashed as to whether that power included the power to control and the duty to improve the waterways. The controversy was ended in 1824 by the decision of the Supreme Court under the leadership of John Marshall, and repeatedly reaffirmed in a long line of subsequent judicial decisions, which destroyed private monopoly on lakes, rivers, and harbors, and established definitely the authority of Congress over interstate waterways. Congress then passed the first act providing specifically for waterway improvement on the Ohio and Mississippi Rivers and 2 years later the first general river and harbor act became law.

From early times the development of a Federal waterway policy has been a part of the work of the Army Engineer organization, although it was not until 1852 that Congress stated generally that all such expenditures were to be made under the superintendence of the Secretary of War. Later such works were spe-

cifically delegated to the Engineer Department. In 1868 Congress directed that reports of surveys include estimates of the extent to which commerce of the country would be affected by a contemplated improvement. In 1882 the policy of making a preliminary examination to determine roughly the justification for a proposed improvement was adopted and 20 years later Congress established the Board of Engineers for Rivers and Harbors to further insure consideration of all economic as well as engineering factors involved in each contemplated improvement.

The Transportation Act of 1920, terminating wartime Federal control of the railroads, contained the most significant and definite pronouncement of the policy of Congress:

> * * * to promote, encourage and develop water transportation service and facilities in connection with the commerce of the United States, and to foster and preserve in full vigor both rail and water transportation.

It assigned to the War Department extensive investigations of appropriate types of boats, water terminals, water and rail interchange connections, etc.:

> * * * with the object of promoting, encouraging and developing inland water transportation facilities.

This act also transferred

> * * * all boats, barges, tugs, and other transportation facilities, on the inland, canal, and coastwise waterways acquired by the United States in pursuance of the fourth paragraph of Section 6 of the Federal Control Act * * * to the Secretary of War, who shall operate or cause to be operated such transportation facilities * * *.

The Amendment of 1921 further authorized the Secretary of War to construct or lease terminal facilities for the interchange of traffic with other carriers by rail or water. The Act of 1924 created the Inland Waterways Corporation to operate the Federal Barge Lines on the inland waterways of the Mississippi and Warrior Valleys with the exception of the Ohio, its tributaries and certain other rivers. The Amendment of 1928, known as the Denison Act, authorized the extension of operations of the Inland Waterways Corporation to all improved tributaries or connecting waterways of the Mississippi River with sufficient and dependable channels. It further declared it to be the policy of Congress to continue operation of the Federal Barge Lines until navigation facilities had been provided adequate for dependable and regular transportation service with terminals adequate for joint rail and water service, and until:

> * * * joint tariffs with rail carriers shall make generally available the privileges of joint rail and water transportation upon terms reasonably fair to both rail and water carriers.

It also authorized any common carrier river services on the Warrior, Mississippi, Columbia, Snake, Sacramento, San Joaquin, or Savannah Rivers to obtain certificates of public convenience and necessity requiring all connecting common carriers to join with them in through routes, joint differential rates, and equitable divisions of revenue, for the purpose of extending the benefits of water transportation to regions not directly accessible by waterway.

With the passage of the Transportation Act of 1940, Congress modified its long-established general policy that a navigable waterway was a public highway and should be open to the free and unrestricted use of all. It adopted in its stead a policy of Federal regulation of the inland waterways and water carriers through the Interstate Commerce Commission. Section 1 of the act enunciates the new policy in the following words:

> It is hereby declared to be the national transportation policy of the Congress to provide for fair and impartial regulation of all modes of transportation subject to this act, so administered as to recognize and preserve the inherent advantages of each; to promote safe, adequate, economical, and efficient service and foster sound economic conditions in transportation and among the several carriers; to encourage the establishment and maintenance of reasonable charges for transportation services, without unjust discriminations, undue preferences or advantages, or unfair or destructive competitive practices; to cooperate with the various States and the duly authorized officials thereof; and to encourage fair wages and equitable working conditions; all to the end of developing, coordinating, and preserving a national transportation system by water, highway, and rail, as well as other means, adequate to meet the needs of the commerce of the United States, of the Postal Service, and of the national defense. All of the provisions of the Act shall be administered and enforced with a view to carrying out the above declaration of policy.

With the sentiments of this general declaration of policy no fault can be found. Some of the specific provisions may need clarifying and will require extreme care in their administration to avoid imposing unnecessarily burdensome restrictions on inland water carriers in contravention of the declaration itself. It will be well nigh impossible to apply provisions requiring permits and certificates without causing fairly high mortality among the applicant carriers and higher rates for the survivors. The specific provisions of the 1940 Act which affect inland water carriers most profoundly are those authorizing and requiring the Interstate Commerce Commission to fix minimum and maximum rates of common carrier and minimum rates of contract carrier water lines, and to restrict the operations of such carriers to definite routes, and otherwise exercise control through the issuance or withholding of certificates of public convenience and necessity and permits.

There is significance in the implications which may be drawn from the provisions and amendments rejected

when the act was under consideration. In 1940 Congress pointedly refused to:

(*a*) Repeal the long-and-short-haul clause.
(*b*) Terminate the river improvement program.
(*c*) Impose tolls for use of navigation facilities.
(*d*) Subject bulk cargo carriers to regulation.
(*e*) Tie water rates to the rail rate structure.
(*f*) Abolish Federal barge line service.

In the reorganization of Executive departments in 1940, the Inland Waterways Corporation was placed under the jurisdiction and authority of the Secretary of Commerce, but its service was not curtailed.

Administration of River and Harbor Works

Responsibility for the operation, maintenance, and improvement of rivers and harbors is vested in the Secretary of War. The work is carried out under the direction of the Chief of Engineers by the Engineer Department, an organization composed of officers of the Corps of Engineers together with the necessary technical, administrative, and clerical personnel and skilled labor. Included in this personnel are specialists in engineering, economics, law, finance, and administration.

The Engineer Department is divided into 48 districts, the boundaries of which conform roughly to watersheds. The districts in turn are grouped into 12 divisions which are in general so arranged that they embrace related works. Each district and division is under the charge of an officer of the Corps of Engineers as District or Division Engineer.

Congress has created various special boards and commissions which function under the supervision of the Chief of Engineers as a part of the Engineer Department. The most important of these bodies are: The Board of Engineers for Rivers and Harbors, the Mississippi River Commission, the California Debris Commission, the Beach Erosion Board and the Shore Protection Board.

Incidence of River and Harbor Projects

Investigations of contemplated improvements of rivers or harbors are initiated by Congress, also by local government officials, etc., usually at the request of commercial, industrial, and navigational interests in the area.

In the case of either a preliminary examination and survey or a review of previous reports the study is usually assigned by the Chief of Engineers to the appropriate Division Engineer, who in turn assigns the field investigation to the proper District Engineer.

When directed to make a preliminary examination of a waterway, the District Engineer inspects the locality and holds a public hearing at which proponents and opponents of the improvement are afforded full opportunity to express their views. All available information bearing on the question is sought. The present navigable capacity of the waterway, the extent and resources of the tributary area, the needs of present and prospective commerce and the vessel traffic are ascertained. Particular emphasis is placed upon the relationship which the proposed improvement bears to an integrated development of the water resources of the whole basin and upon analysis of the economic benefits and savings which the contemplated improvement may be expected to yield to the Nation at large. The District Engineer's report, with the Division Engineer's recommendation, is submitted to the Board of Engineers for review. If the recommendation of the Division Engineer is unfavorable to a survey, he issues a public notice to all those known to be interested and they have the privilege of appealing his decision to the Board of Engineers. If the Chief of Engineers concludes that the requested improvement is not justified, he so reports through the Secretary of War to Congress. If he believes that a survey is justified, he assigns its preparation in the same manner as the preliminary examination.

The survey report includes all data contained in the report on preliminary examination, amplified and modified by detailed surveys in the field, as may be necessary to conform to the latest information. The report, after review, is submitted by the Secretary of War to Congress.

Only in rare instances has Congress authorized a project upon which the report of the Chief of Engineers was not favorable. However, when the report is favorable, the project is considered in Committee hearings and, if deemed sufficiently meritorious, is included in an authorization bill, usually designated as a River and Harbor Bill or a Flood Control Bill.

If and when this bill becomes law, the projects under consideration are submitted to the Bureau of the Budget before allocation of funds is made for projects proposed to be undertaken. Actual work on the project is undertaken only after the project has been adopted, the appropriation made by Congress, and after requirements of local cooperation have been fully met.

Past experience has demonstrated conclusively that the prosecution of river and harbor projects under piecemeal appropriations invariably results in inefficient operation and lack of economy. Since 1922 Congress has followed the highly desirable procedure of permitting projects to be prosecuted by direct appropriation, by continuing contracts, or by both. Maintenance and operation of completed projects are accomplished with funds earmarked for the purpose

in a lump-sum appropriation made annually by Congress.

The general plan of development of the water resources of the Nation, founded mainly on the comprehensive surveys of all the river systems made by the Engineer Department in accordance with House Document 308, 69th Congress, 1st Session, is continually being modified to keep abreast of new developments. The adoption of new plans and the adjustment of old ones require comprehensive analyses of many factors to determine adverse as well as beneficial effects.

Expenditures for River and Harbor Improvements

As of June 30, 1939, existing projects for improvements for navigation in the United States and its territorial possessions numbered 738, of which 439 had been completed, 259 had been partially completed and 40 had not been started. Many of these projects are enlargements or modifications of projects adopted many years ago. The total capital cost to the Federal Government to June 30, 1939, for all these river and harbor works, excluding flood control, was $1,829,000,000. The accompanying distribution chart (Fig. 38) breaks down this figure according to kind of project.

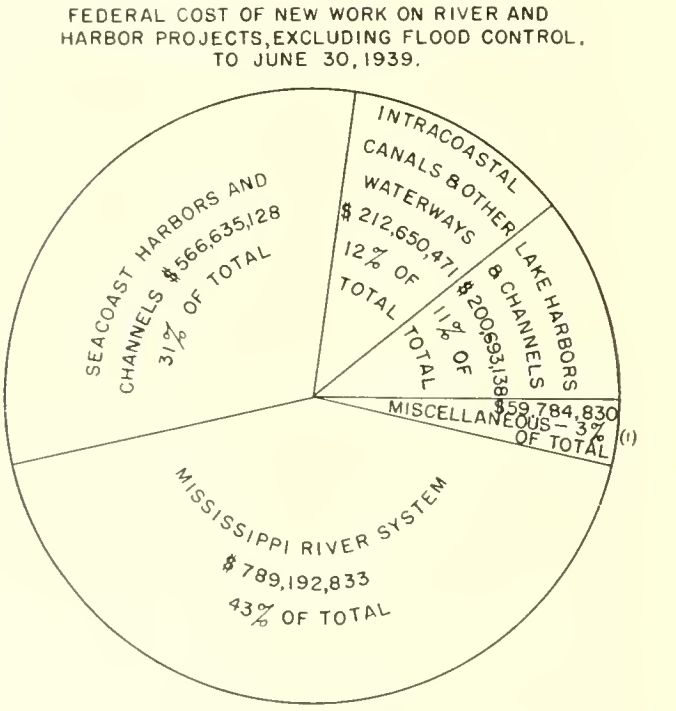

FIGURE 38

In addition, the total Federal money expended for operation and maintenance of previous and existing navigation improvements was $665,000,000. Of this amount $164,000,000 was for operation and care of locks and other navigation structures and $49,000,000 was for examinations, surveys, and contingencies, and for administration of Federal laws enacted for the protection and preservation of the navigable waters of the United States. Government-owned plant operated by the United States Engineer Department on improvements for navigation is evaluated at $43,500,000.

Complete and accurate data regarding expenditures by States and local public agencies for navigation purposes are not available. State expenditures for construction and maintenance, including carrying charges to June 30, 1931, less tolls collected prior to that date, have been placed at approximately $530,000,000, of which about $330,000,000 have occurred since 1890. The New York State Barge Canal and the Chicago Sanitary and Ship Canal account for most of the latter sum. Expenditures since 1850 for inland waterway improvements, other than terminal facilities, by the individual States and their political subdivisions have been small, judged by such data as are available.

Adoption and execution of 129 of the 738 projects existing on June 30, 1939, were subject to provisions that local interests make cash contributions totaling $24,483,000 to cover benefits considered strictly local in character. Contributions amounting to $22,962,000 were made, but the remaining obligations were not met by local interests and as a result prosecution of work on the projects involved has been deferred. Most existing projects require that local interests furnish, free of cost to the United States, necessary easements, rights-of-way and spoil disposal areas during initial construction and for future maintenance as and when required, and to hold the Government free from claims for damages attributable to the improvements and their maintenance. On practically all navigation projects, local interests are also required to construct terminals open to the public on equal and reasonable terms and to provide suitable public highway approaches thereto; to construct new bridges and to make necessary alterations to existing bridges as may be required; to dredge branch channels and turning basins; and to provide other appropriate measures of cooperation. Expenditures made by local interests in meeting such requirements in connection with existing projects cannot be reliably estimated.

Lighthouses, light ships, buoys, fog signals, and various other aids to navigation are established and maintained by the Coast Guard. Data showing total ex-

penditures for new work in this category and for maintenance are not readily available. The average annual expenditure since 1930 was approximately $11,950,000, of which $3,250,000 was for new work and $8,700,000 for maintenance and operation.

There is no reliable record of the total local public investment in waterway terminals. The report of the Federal Coordinator of Transportation on Public Aid estimates the total investment in publicly owned water terminals of all sorts to 1936 as $1,100,000,000. A note in one of the appendices of this report gives a percentage analysis of that total which results in the following break-down:

Seacoast harbor terminals	$924,000,000
Great Lakes terminals	33,000,000
Inland waterway terminals	143,000,000

The financing of local inland waterway terminals takes on the character of local betterment projects more frequently justified by indirect benefits to the community in attracting business than by the direct collection of terminal fees or rentals. As terminals are, however, a necessary adjunct to transportation by inland waterway the unit terminal handling differentials assessed against barge movements in the comparisons with other forms of transportation hereinafter analyzed include, as closely as can be estimated, annual fixed charges, figured at private commercial rates on terminal facilities in use.

The record of expenditures taken from the Annual Reports of the Chief of Engineers shows the total Federal capital investment and the accumulated expenditures for maintenance and operation since the beginning of Federal control in 1828. Included in the cost of new work are items covering works which, however useful they may have been, do not now contribute in any way to facilitating present navigation. It is worthy of note that no such figures are available for other forms of transportation. The comparison of this recorded total cost of waterways with only the present inventory cost of other forms of transportation is a distortion that is inevitably unfavorable to waterways. For instance, to meet progressively increasing requirements of river traffic, old structures in the Upper Mississippi, the Ohio, the Warrior, and other rivers have had to be removed when superseded by existing locks and dams. The cost of removing superseded structures is properly included as a charge against existing projects, but the initial capital cost of the outmoded structures should be set apart and not included as a charge against present traffic in evaluating existing improvements.

No attempt is made here to list the many such items appearing in the official records of Federal expenditures. These elements are analyzed in detail when called for in connection with specific examinations and surveys. It is desired to restate here the general principle that prospective savings on future water-borne commerce are not required to carry the annual charges on obsolete or superseded navigation improvements in order to justify existing projects. The benefits realized through savings in transportation costs need meet only the cost of carrier service plus the cost of construction, maintenance, and operation, and incidental damages of the navigation facilities currently used and useful to warrant the provision of a waterway improvement. Otherwise an adverse appraisal might deprive the public of a valuable economic asset because the proposed improvement could not justify "sunk" costs in works contributing in no degree to the new project.

Inland Waterways Commerce, Rates, and Charges

Development and Expansion of Commerce

Prior to the advent of railroads, waterways afforded the only means of transportation other than movement at great cost in animal-drawn wagons over the very few improved roads that had been provided for interurban traffic. Commerce naturally expanded along navigable streams. The development of the railroads changed this trend, and population and industry settled where supplies of raw materials were first discovered, and continued to concentrate in these localities long after the exhaustion of initial deposits and the discovery of new supplies in isolated areas. As a result, the regions that are now richest in natural resources are remote from the districts where they are processed for distribution. Such a situation requires an excessive amount of transportation, beneficial principally to the overland carriers, and it would appear that a gradual decentralization of population and industry, over a period of time, is desirable in the national interest. The potentialities of inland water transportation in accomplishing this purpose are now being recognized and made effective.

The change in trend in the distribution of all traffic in the country is indicated in table 2, which gives the percentage of the total traffic handled by each agency of transport, based upon the total revenue ton-miles handled for the years 1926, and 1936 to 1939, inclusive. The table shows a decline in the proportion of total ton-miles handled by the railroads over this period of time, while general increases are shown for truck traffic, traffic handled by oil pipe lines, and waterways, exclusive of the Great Lakes tonnage. Actually, the inland waterway traffic exclusive of Great Lakes tonnage increased from 9,542,877,000 ton-miles in 1926 to 19,937,499,000 ton-miles in 1939.

TABLE 2.—*Distribution of Total Revenue Ton-Miles for All United States Traffic*

Kind of carrier	Percent of total revenue ton-miles				
	[1] 1926	[1] 1936	[1] 1937	[2] 1938	[3] 1939
Railways, steam and electric	75.6	66.4	64.7	63.5	61.9
Trucks (intercity) (note 1)	3.9	7.8	7.7	8.0	8.5
Inland waterways:					
Great Lakes	15.2	15.0	16.6	10.6	14.1
Other inland waterways	1.6	3.0	3.0	3.9	3.6
Oil pipe lines	3.7	7.8	8.0	14.0	11.9
Air carriers	(4)	(4)	(4)	(4)	(4)
Total	100.0	100.0	100.0	100.0	100.0

[1] Figures shown in "Report of Committee, appointed September 20, 1938, by the President of the United States to Submit Recommendations Upon the General Transportation Situation."
[2] Figures taken from Annual Report of Interstate Commerce Commission, issued November 1, 1940.
[3] Figures for 1939 are estimated on basis of the preliminary reports of ton-miles for the calendar year 1939.
[4] Less than 1 percent.

NOTE.—The percentages shown for trucks include both for hire and private trucks.

Principal Commodities Transported

Up to the present time, the major portion of the traffic handled by our inland waterways has consisted of bulk commodities in their raw state or in semi-manufactured form. Most of these commodities move in heavy or bulky loads and do not require fast delivery as in the case of finished products; nor are they readily susceptible to damage or deterioration from handling or delay in transit or from adverse weather conditions. Such commodities include iron ore, coal and coke, and petroleum and its products. Moreover, the nature of these commodities is such that they are not dependent on railroad standby service, as they can be transported on waterways during open seasons and stored or stock-piled during closed seasons. How successfully this system has been worked out is demonstrated in the case of our northernmost waterways which are closed to water transportation during the winter months.

The successful use of the combination water-rail and water-truck haul in the transportation of one or more of these commodities has been demonstrated, and the low costs which result from this method of transportation suggest the feasibility of the distribution of other commodities in connection with the shallow-draft inland waterways. The movement of iron ore from the mines in northern Minnesota to the consuming areas by the rail-lake route has been carried on over a period of years with the greatest efficiency and economy.

Coal and coke.—The value of water as a means of aiding in the distribution of coal is seen in the development and use of the rail-lake-rail route over which the largest volume of inland water-borne coal is moved from the rich eastern fields to the midwestern States. Other instances include the transportation of coal from the New River-Pocahontas fields to tidewater Virginia, then by water to North Atlantic ports and by rail inland, at lower costs than by the all-rail routes; by rail from the mines of West Virginia to tipples on the Kanawha, then by water to Cincinnati and by rail to interior destinations, at lower cost than the through all-rail rates. The wider distribution of this commodity over the interior of the country by the operation of the water-rail haul serves to help in the decentralization of industry.

With the completion of the Monongahela for navigation, the water-borne coal tonnage consumed in the Pittsburgh steel district has shown a continuous increase. Similar increases in this traffic have taken place on the Ohio, Kanawha, and Illinois Rivers and upon the recently canalized Upper Mississippi River. The Illinois and Upper Mississippi Rivers record the greatest recent increases in water-borne coal.

Petroleum and petroleum products.—During the past decade all of the major oil companies have made use of the inland waterways and especially of the Mississippi River System to effect a more economical means of serving interior areas. Nine separate producing fields utilize these waterways. Pipe lines convey oil products several hundred miles from refineries to river terminals where they are transferred to tank barges for widespread distribution along the waterways and, in conjunction with rail and motor truck, to interior consuming areas.

Other basic commodities.—Of remaining groups of basic commodities transported by inland waterways, logs and lumber, sand and gravel, stone, and grain stand out as the most important as regards volume carried. Logs and lumber are still the principal commodities handled on the inland rivers of the Pacific coast area, the water-borne tonnage having increased from 10,391,269 tons in 1926 to 17,691,356 tons in 1939. Prior to the improvement of inland waterways, logs could be rafted only downstream and only during freshets. Now it is possible to use the streams in all seasons and rafts can be towed upstream and logs can be barged and thus better protected. Sand, gravel, and stone which are found in large quantities along river banks are of low value and must seek the most economical means of transportation in bulk in large volume.

The transportation of grain has been seriously interrupted by the closing of the export markets. In the past, it has been of importance to the Mississippi River System. In the Middle West grain was formerly consigned to the Gulf ports for transshipment in coastwise or export vessels, but during the last 4 or 5 years considerable domestic grain traffic has developed to inland river ports where it is milled for domestic consumption. Grain elevators on these rivers offer higher prices to the farmers by reason of the low-cost water

transportation and this has been one of the major contributing factors influencing water movement.

Mississippi River System

This river system is the most important of the waterway groups, accounting for over 60 percent of the total ton-miles of freight carried on inland waterways in 1939, exclusive of the Great Lakes. The feeder channels to this system of waterways extend into tributary areas from the margin of the Gulf of Mexico to northern Minnesota, traversing territory within easy access of the vast petroleum producing region of the Southwest, the great Grain Belt of the Middle West, the major coal producing fields of the East, and many of the great industrial centers of the country, including the steel producing centers of Chicago and Pittsburgh.

In 1939 the freight traffic on this system amounted to 96,348,519 tons, including coastwise, import and export traffic, but excluding ferry traffic. This represented an increase of over 20 percent from 1935, the year in which improvements on many of the shallow draft inland rivers were completed. Over 92 percent of this traffic was bulk tonnage. The increases shown for coal and coke, petroleum and petroleum products, iron and steel products, and sulphur were outstanding.

Coal traffic.—The domestic coal traffic including coke, which is a small amount of the total tonnage, amounted to 40,941,956 tons in 1939. This represented an increase of about 22 percent over 1935, 2 percent over 1937 and 34 percent over 1938. This increase was accounted for in part by the greater general industrial activity and in part by the additional movement of this commodity on the Illinois Waterway and upon the recently completed work on the Upper Mississippi River. The Illinois Waterway coal tonnage increased from 493,500 tons in 1937 to 1,733,200 tons in 1939. The Upper Mississippi for the same period increased from 90,500 tons to 407,400 tons.

Petroleum and petroleum products.—This traffic, amounting to 17,997,005 tons in 1939, ranked second in volume of tons transported and has increased rapidly during the past 5 years. The movement of petroleum is more diversified than that of any other commodity, as the traffic moves both up and down stream and is widely distributed over the entire navigable system. Some of the private oil companies on these rivers have extensive investments in both towboats and tank barges, while other companies lease, charter, or contract for the handling of their tonnage.

Iron and steel articles.—The rapid increase in volume of tonnage over the past few years makes this item of traffic particularly important, although the total volume carried in 1939 amounted to 3,614,619 tons. The ability to transport by water both the semimanufactured products and finished products, composed of many heavy and bulky articles of variable size and length in large volume movements, has been an important factor in the development of this traffic. The fact that most of the important producing plants are located on or near these waterways has also contributed to this increase of water tonnage. Producing plants located at Chicago, Ill., St. Louis, Mo., Ashland, Ky., Wheeling, W. Va., and Pittsburgh, Pa., have utilized these waterways extensively for the transportation of iron and steel products to fabrication or storage plants located at important distribution points such as Memphis, Tenn., New Orleans, La., and Houston, Tex.

Sulphur.—The transportation of sulphur on the Mississippi River System increased from 283,227 tons in 1935 to 704,006 tons in 1939. The commodity is particularly adapted to water carriage. It is not easily damaged, can be handled in bulk, and may be transported in open floating equipment. The low market value of sulphur necessitates low transportation charges and wherever possible it is transported by water in volume. The preponderance of this tonnage is long-haul traffic, originating at Galveston, Tex., or Port Sulphur, La., and moving to upper river ports as far north as Chicago, Ill., and Pittsburgh, Pa., without change of equipment.

Other Systems

These include Atlantic Coast rivers, Pacific Coast rivers, and Gulf Coast rivers, but they represent together only about 20 percent of the total tonnage transported on inland waterways in 1939. The major portion of the traffic transported upon the Atlantic Coast waterways consisted of petroleum and petroleum products, sand and gravel, stone, and coal and coke. On the Gulf Coast rivers the principal commodities transported were petroleum products, and logs and lumber. Logs and lumber constituted by far the greatest tonnage on the Pacific Coast rivers.

Canals and Connecting Channels, Federal, State, and Private
Volume of Tonnage Transported

	1935	1939	Percent of increase
Federal	116,714,260	183,400,978	58
State and private	5,968,526	7,626,527	28
Total	122,682,786	191,027,505	56

This tabulation shows the relationship between the tonnage transported on Federal as compared with State and private canals. It will be noted that the increase in volume of traffic on the Federal canals has far outdistanced that for State and private canals since 1935.

Rates and Charges of Inland Water Carriers

Presentation of the rates or charges that are assessed by carriers operating upon the inland waterways as discussed herein deals with these waterways by geographical regions or groups of rivers reflecting as nearly as possible the same transportation conditions. The discussion of the water-carrier rates is confined to the movement of the most important traffic handled on waterways of 12-foot or less depth. For our purposes the waterways have been segregated into three major groupings:

1. The Mississippi System of waterways, comprising all navigable rivers that flow into the Mississippi River.
2. Atlantic and Gulf Coastal rivers and intracoastal canals.
3. Pacific Coastal rivers and canals.

Mississippi River system.—On account of the outstanding position of the Mississippi River System in the inland waterways, the discussion of rates and charges will be confined mostly to this system. Furthermore, common-carrier rates are eliminated inasmuch as they are available for study in the records of the Interstate Commerce Commission. Private-carrier rates are eliminated because the operation of these carriers is confined almost exclusively to the transportation of the products of the proprietary companies.

Basis of the rate chart.—The rate chart (Fig. 39) that is used herein was prepared to indicate the general level of contract rates that are being charged for transporting the principal water-borne commodities. However, it should be made clear that while the average rates shown on the chart herein reflect the general level of charges for contract hauling upon inland rivers, the component rates were not actually made upon a definite mileage scale like that used herein. In order to make the basic information as complete and representative as possible, certain adjustments in rates were necessary and various other factors had to be given weight. For instance, rates for towing service involving only power equipment, were adjusted to a basis comparable with operations including the furnishing of both power and cargo equipment. The influence of the varying characteristics of the different rivers traversed, the volume of traffic handled, the light loading of cargo barges destined for interchange between 9-foot and 6-foot channels, the subcontracting of tonnage on feeder waterways—all are integrated in this general-average rate chart.

Coal rates.—About 19 percent of the coal tonnage is handled by contract carriers and the chart attached shows the average rates charged. The extreme movement depicted in the rate chart of 1,600 miles represents experimental movements by water from the West Virginia fields to the Twin Cities on the Upper Mississippi. The highest revenue, 4.3 mills per ton-mile, is received on the hauls of less than 100 miles. The average revenue for hauls not in excess of 400 miles is 2.5 mills per ton-mile, and the average revenue for the entire range by 100-mile blocks is 2.3 mills per ton-mile. The significant fact indicated by the coal scale is that, when the average revenue received for transporting this commodity over different rivers and between different points of origin and destination is measured, the ratio of charges reflect the same general level. This would indicate that the ceiling for the transportation of this

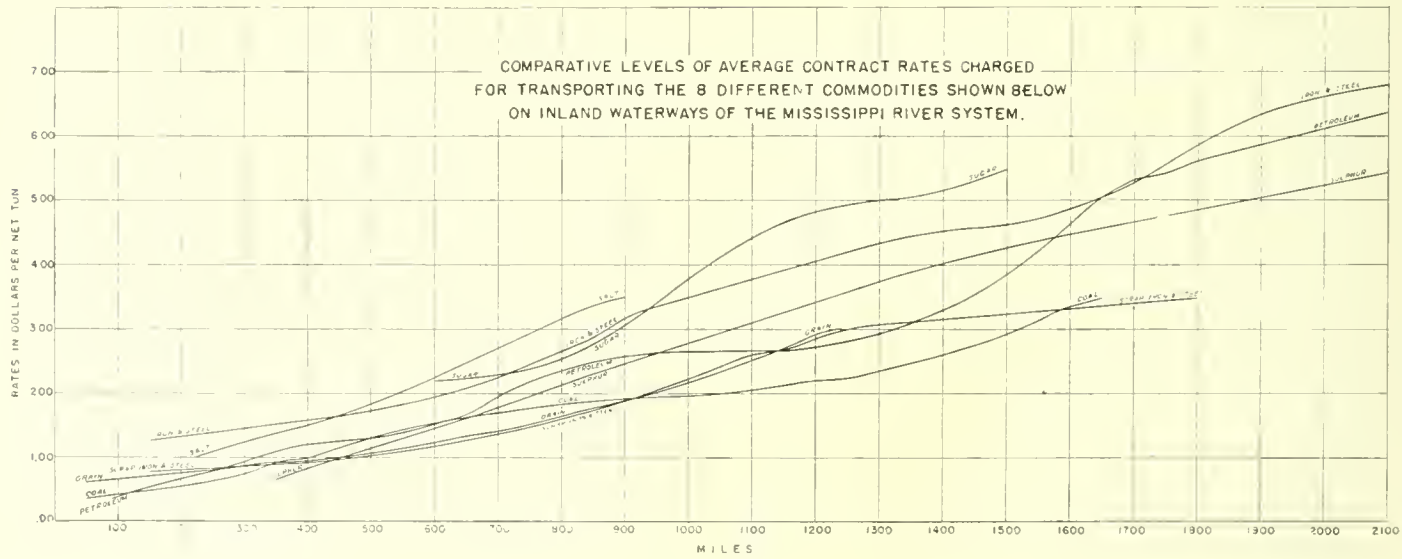

FIGURE 39

commodity by water is more or less established on all these waterways and is closely related to the cost of performing this transportation service.

Petroleum rates.—The average scale of rates shown for petroleum represents a mean average assessed by the contract carriers over all navigable waterways of this system. Contract carriers and common carriers transport about 50 percent of this tonnage. The rates include movements over 9-foot waterways, from 9-foot to 6-foot and to incomplete waterways of variable depth. The maximum revenue per ton-mile occurs within the 200-mile block, the minimum between the 1,100 and 1,600 blocks. The average revenue for all hauls was 2.85 mills per ton-mile.

Iron and steel articles—Rates.—The chart shows the average rate for handling iron and steel articles by contract carriers who transport about 23 percent of this tonnage and includes movements to all parts of the Mississippi River System and reflects operations over 9-foot, 6-foot and incompleted waterways. The influence of competition between different steel producing areas has in some instances affected the rates of contract carriers to the extent that the charges assessed for transporting iron and steel products from the Chicago area have been equalized with the rates from Pittsburgh, Pa., to certain important destinations on the lower Mississippi River and Gulf of Mexico. The revenue per ton-mile shown on the chart ranges from a high of 6.7 mills at 200 miles to a minimum of 3.0 mills at 1,600 miles. The larger volume of this traffic moves within the 600 to 1,800-mile range with an average of 3.2 mills.

Grain rates.—Contract carriers handle about 52 percent of the grain traffic and rates vary substantially on different draft waterways. The average rate shown on the chart relates to tonnage on the 9-foot waterways. The average revenue per ton-mile is approximately 2.1 mills. At the 600-mile point it is also 2.1 mills and at the 100-mile point it is 2.19 mills.

Scrap iron and steel rates.—Prior to 1938 very little of this traffic moved over inland waterways, while in 1939 about 600,000 tons were transported on the Mississippi System alone, the larger part being handled by contract carriers. Analysis of the rate chart indicates that the rate for different hauls has had an even trend with little variation other than a slight peaking of the scale between the 1,050 and 1,200-mile distances. The low revenue per ton-mile of 1.9 mills is reached at the 1,800-mile distance, the high unit revenue of 4 mills at 200 miles, with an average of 2.36 mills for the entire range of hauls.

Sugar rates.—The average rate shown on the chart includes movements over both 6- and 9-foot waterways. The average revenue level for the range of hauls shown is 3.6 mills per ton-mile. The rate charged for transporting this commodity is somewhat higher than for the other commodities handled in volume. This is accounted for in part by the fact that it is more susceptible to damage, moves in packages, and has a relatively high unit value.

Sulphur rates.—It is estimated that about 35 percent of this tonnage is handled by contract carriers at special rates. The rates are low as will be seen by referring to the rate chart. This scale reflects inland water movements for short distances along the Gulf Intracoastal Canal as well as upon both the 9-foot and 6-foot inland rivers. The peak revenue occurs on the short hauls. Beyond this range in haul the revenue in mills per ton-mile is fairly constant and varies little from the 600-mile haul to the maximum of 2,100 miles.

Revenue per ton-mile for basic commodities.—In order that the average revenue for the transportation of basic commodities in mixed tows may be noted, the mean revenue in mills per ton-mile has been computed. To obtain this revenue level, a mean average of the revenue produced on each of the basic commodities shown, was used. It was found that an average of 4.7 mills is received at 50 miles, 2.94 mills at 2,100 miles. The average of revenue for the entire range of hauls is 2.98 mills. From the cost data secured from representative barge lines it is evident that these rates individually and collectively represent a comfortable margin of profit for carriers, as well as a substantial margin of savings for the shipping public.

Atlantic and Gulf coastal rivers and intracoastal canals.—An analysis of the contract carrier rates for traffic transported upon the Atlantic coast waterways was confined to petroleum transported on the rivers and inland waterways from the Virginia Capes south to Florida, and the average rates charged for transporting lumber, ties, fertilizer, and miscellaneous commodities. For petroleum the average rates vary from 40 cents per ton at the 10-mile distance to 90 cents a ton at the 150-mile distance. For the other commodities the average rates vary from 45 cents per ton for a 5-mile haul to $1.40 per ton at the 300-mile point. As regards the Gulf coast rivers, the only rates of record in sufficient number to permit determination of an average rate were those for petroleum transported over this group of waterways. The average rates vary from 27 cents per ton at 50 miles to 85 cents at the 340-mile distance.

Pacific coast rivers.—The average contract rates on basic commodities including lumber, petroleum, wheat, iron, and steel transported on the Pacific Coast rivers vary from 65 cents per net ton at the 20-mile point to $1.45 per net ton at the 190-mile distance.

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Cost of Inland Water Carrier Service

At this stage in the development of modern water carrier service, it is more essential to know what can be accomplished toward efficient, economical transportation by suitably equipped barge lines under intelligent management than to attempt to form definite conclusions as to the present general costs of operating the service. For that reason, only cost figures from efficient carriers' records have been used which represent the extent to which operating expenses can be controlled when equipment is suited to kind and volume of tonnage, and service is not hampered by restrictions or to any great extent by diverted traffic.

The cost figures for private carriers and for contract carriers, as given herein, pertain to water-line haul only. They include costs covering capital charges, depreciation, taxes, other insurance, operation, maintenance, and all other expenses incidental to operation. As regards common carriers, the cost per ton-mile figures for the Inland Waterways Corporation are based on the operating expenses as shown in the Annual Reports of the Inland Waterways Corporation to the Secretary of War for 1936, 1937, and 1938. However, it should be noted that these costs do not include any capital charges, as in the case of contract carriers, and this fact should be taken into consideration in making any cost comparison. These expenses, as reported, include terminal maintenance and terminal operating costs. Consequently, costs per ton-mile are shown both including and excluding the terminal costs as given in the annual reports. The ton-mile figures shown are taken from the Annual Reports of the Chief of Engineers, United States Army. The tabulation giving costs per ton-mile for the Mississippi Valley Barge Line is taken from I. C. C. Docket 26712, exhibit No. 201, and includes terminal costs.

Mississippi River System

A more comprehensive analysis of transportation on this river system can be made than on any other group of navigable waterways. This is due to the large number of carriers reporting, and to the general similarity of equipment and functions of reporting carriers.

Common carrier costs.—The most readily obtainable data on the cost of operating common carriers can be obtained from the records of the Inland Waterways Corporation which operates the Federal Barge Lines under the general direction of the Secretary of Commerce. The following tabulation gives the reported unit cost of operation on a ton-mile basis for this company on the Upper and Lower Mississippi and the Illinois Waterways for the years 1936 through 1938, but these figures are not directly comparable to private operation.

Calendar year	Ton-miles (thousands)	Cost of operation in mills per ton-mile	
		Terminal costs included [1]	Terminal costs excluded [1]
1936	1,523,000	3.45	2.00
1937	1,681,000	3.54	2.03
1938	2,224,000	2.68	1.59

[1] Terminal costs as shown in the annual reports of the Inland Waterways Corporation for 1936, 1937, and 1938.

Mississippi Valley barge line.—The Mississippi Valley Barge Line costs per ton-mile as taken from I. C. C. Docket 26712, exhibit No. 201, are given herewith for the years 1931 through 1937.

Calendar year	Total net ton-miles	Cost per ton-mile
	Thousands	*Mills*
1931	160,314	3.638
1932	292,711	3.049
1933	320,846	3.175
1934	426,879	2.948
1935	447,352	2.631
1936	432,715	2.693
1937	490,138	2.487
Average	367,279	2.93

Contract carrier costs.—The composite contract carrier costs constructed from the weighted averages of the unit costs of transporting coal and coke, petroleum and petroleum products, iron and steel articles, grain, scrap iron, sugar, and sulphur for average hauls varying from 90 to 600 miles for coal and coke, and up to 815 miles for iron and steel articles, show average unit costs per ton-mile ranging from 2.41 mills at the 100-mile block to 1.87 mills at 850 miles. The average cost for the entire range of distance is 1.977 mills per ton-mile.

Private carrier cost.—The operation of privately owned water carrier equipment is conducted usually as a component part of the parent company's business operations and as such is not considered a proper earning venture within itself. However, some of the larger companies have recognized the value of isolating their total water cost in order to determine to what extent the use of their own equipment is preferable to that of the for-hire operator. Examples of private carriers operations that include all the elements of water transportation costs are given below.

Coal carriers	*Cost per ton-mile (mills)*
Average haul (miles):	
50–100	4.2–2.0
101–180	2.0–1.5
200–260	2.0–2.1

Petroleum carriers	*Cost per ton-mile (mills)*
Average haul (miles):	
70–100	[1] 5.7–6.0
138–250	[1] 3.5–5.0
270–400	3.8–3.6
500–600	2.7–2.5
700–1,000	2.0–2.0

[1] Involves partial movement over shallower draft waterway.

Gulf Coast Rivers and Canals

Operations on these inland waterways are mostly of a private nature, although a few common and contract carriers serve certain areas bordering on these waters. The Inland Waterways Corporation operates a common carrier service on the Warrior-Tombigbee and Intracoastal Waterways between Birmingport, Mobile, and New Orleans. The cost of this service, as shown herewith, was derived from the operating expenses as given in the Annual Reports of the Inland Waterways Corporation to the Secretary of War for 1936, 1937, and 1938. The ton-mile figures were taken from the Annual Reports of the Chief of Engineers, United States Army.

Calendar year	Ton-miles (thousands)	Cost of operation in mills per ton-mile	
		Terminal costs included [1]	Terminal costs excluded [1]
1936	118,000	7.0	3.4
1937	157,000	6.6	3.2
1938	185,000	5.3	2.8

[1] Terminal costs as shown in the annual reports of the Inland Waterways Corporation for 1936, 1937, and 1938.

Other Waterway Groups

Great variation in unit transportation costs exists on the waterways of the Atlantic coast region. This is largely due to the differences in types of equipment used, in waterways traversed, in commodities transported, and in the length of haul. In many sections the operations are local in nature and little data are available that would be useful for comparative analyses.

There is wide variation in costs in conducting inland water service upon the Pacific coast rivers and they are generally much higher than on eastern waterways. Improvements now under way on the Columbia River are expected to provide more economical operating conditions and a consequent increase in water-borne tonnage with a corresponding drop in unit operating costs.

River Terminals and Terminal Operations

The required spotting, assembling, overhauling, and servicing of towboats and barges at way ports and terminals have been included in the computation of the line-haul cost of furnishing water transportation. The necessary handling of freight on and off vessels at river terminals is a separate operation and not included in line-haul operations. In fact, separate organizations and managements are frequently set up to perform the terminal operations as distinct from line-haul service.

The Federal Government does not provide freight terminals on inland waterways, but it has strongly advocated the prevailing system whereby river terminals are built, acquired, and regulated by States or municipalities. Terminals are also provided by private, commercial and industrial enterprises for their own use, and others are owned or leased by the barge lines, or by their subsidiaries. The Chief of Engineers, United States Army, is authorized to withhold appropriated funds from waterway improvement unless at least one public terminal be constructed, owned, or regulated at each water port and held open to the use of all on equal terms.

Frequently, river terminals are built by local contributions and leased to river carriers or others at nominal rentals. In the case of municipal undertakings of this nature the communities evidently consider themselves amply reimbursed through the consequent attraction and stimulation of trade and industry and the growth of population. It should be emphasized, however, that expenditures for locally owned municipal terminals are made for benefits which are of a local nature and funds so expended are the result of local assessment; therefore, they are not a part of any Federal waterway project.

Special difficulties which characterize most water terminal operations have been offset to a certain extent by the economy inherent in the efficient mechanical loading and unloading of water-borne bulk commodities in large quantities. Also, the duplication of terminal facilities and services characteristic of overland transport has no counterpart in waterway transportation. Storage yards, tank farms, gins, elevators, tipples, fixed or movable cranes, conveyors, hoppers, and facilities for transfer between barges and railroad, motor carrier, or stock pile characterize the present day inland waterway terminal. Practically all of the inland waterway terminals equipped for handling commodities in bulk are privately owned and have attained a high degree of efficiency and economy in operation.

The accompanying tabulation gives a few random terminal charges prevailing at several inland waterway terminals. While they may be considered fairly representative, they would not serve as standard rates upon which to construct scales of terminal charges. These rates are for one-way handling, no distinction being made between loading and unloading charges in the returns upon which this particular tabulation is based.

Public River Terminal Charges, One-Way Handling

	Cents per ton
Bulk commodities:	
Coal and coke	15 to 25
Grain	15 to 25
Sulphur, potash, phosphate (crude)	15 to 25
Iron and steel articles	50
Bales, bags, barrels, boxes, and cartons:	
Canned goods, cement, coffee, cotton linters, dried fruits, fertilizers, flour, grain and feed, hardware, paint, salt, soaps and soap powders, sugar, syrup, and molasses	60
Agricultural implements	85 to 100
Sand and gravel	25 to 35
Lumber	100

Following are a few sample per-ton costs of handling commodities in bulk at private terminals.

Handling Costs at Private Terminals

	Cents per ton
Bulk Commodities:	
Coal and coke	4.5 to 15
Grain	10 to 30
Iron and steel	20 to 80
Petroleum	25
Sand and gravel	4 to 12
Scrap iron and steel	10 to 50
Sulphur	10

So many factors are involved in the handling of commodities at river terminals that no general scale of charges or costs can be set up. It should be emphasized that the tables of rates and costs at inland waterway terminals are furnished only as samples. Where appropriate equipment and facilities have been provided in capacity suited to the volume of tonnage passing through the terminal, unit handling costs are found to be lower than in any other type of service. There are many examples of terminals on the inland rivers with equipment considerably in excess of present demands, a circumstance which is conducive to high handling costs. This condition will be remedied, of course, as soon as water-borne traffic builds up to the volume anticipated. The danger of barge terminal congestion because of lack of space and facilities is more serious than overdevelopment, because of the scarcity of riverside property not already adversely held.

Technological Changes in Facilities and Equipment

The technique of modern barge transportation is a recent development and is currently undergoing rapid improvement. The traffic congestion of the war period showed that dependable waterways of adequate dimensions could not be built after the emergency had arisen. One of the duties laid by Congress upon the War Department was the investigation of means of coordinating the network of disconnected channels of varying dimensions and organizing the operation of the miscellaneous floating equipment obtained from other agencies during the emergency. The completion in 1929 of the Ohio River slack-water project to form with the Mississippi a continuous 9-foot waterway from Pittsburgh to New Orleans and the initiation of other important connections of standard channel and lock dimensions stimulated marked advances in carrier methods and equipment. Industry and competing transportation agencies were quick to respond to this impetus and subsequent progress in the development and use of more efficient and better adapted equipment and operating methods has been general.

Trends in channel and lock dimensions.—Acceptance of 200-foot minimum width and 9-foot controlling depth represents a compromise between topographic and hydraulic limitations and the demands of the cargo carriers for ample navigating space. Early preference for the "standard coal barge," 175 feet long with 26-foot beam, influenced the adoption of the 600 by 110-foot lock chambers on the Ohio. Elsewhere, however, lock and channel dimensions seem to have dictated the sizes and types of barges and towboats and their formations. Table 3 gives the controlling depths and lock dimensions of the principal canalized links of the inland waterway system:

TABLE 3.—*Principal Canalized Inland Waterway Projects*

Name	Length in miles	Depth in feet	Number of locks	Lock chamber dimensions	
				Length (feet)	Width (feet)
Allegheny River	72	9	8	360	56
Monogahela River	91	9	7	360	56
Ohio River	981	9	46	600	110
Kanawha River	91	9	4	360	56
Tennessee River	648	9	7	358	60
Do			2	600	110
Illinois River	327	9	7	600	110
Upper Mississippi River	663	9	26	600	110
Warrior-Tombighee Waterway	472	9	15	286	52
Louisiana-Texas Intracoastal Waterway	565	9	3	425	75
New York State Barge Canal	195	14	30	300	45

Prescribing overhead clearances for fixed bridges represents a compromise between navigation requirements and the practical obligation to minimize interruptions to overland traffic. The following established vertical clearances illustrate the wide variation dictated by local conditions:

Overhead Clearances of Fixed Bridges

	Feet
Chicago Drainage Canal	16.8
Calumet-Sag Channel	10.7
Ohio River	25.0
Upper Mississippi River	42.0
Lower Mississippi River	55.0 to 133.0

The adoption of devices for lowering the pilot houses and collapsing the stacks of towboats for passing under

bridges without slackening speed has contributed to the efficiency of barge service in congested areas.

Improved types of power equipment.—Five important recent scientific developments, serve to produce lower operating costs wherever they have been put into use, and there is little doubt that they will progressively supplant the older types of power and floating equipment either in their present or in some more refined future form. These are:

(*a*) The design, through model tests, of streamlined hulls, with the rake eliminated from interior components of tows, decreasing water resistance and increasing speed.

(*b*) The use of electric welding in place of riveted steel construction, producing lighter and stronger hulls with greater carrying capacity.

(*c*) The adaptation of twin-screw propellers with fore-and-aft rudders to use in light draft channels, resulting in greater power and maneuverability.

(*d*) The Kort nozzle, designed to feed unbroken columns of water to the propellers, increasing efficiency and rudder effect.

(*e*) The Diesel engine, which occupies less space than equivalent steam power, uses less fuel and requires a smaller crew.

Standardization of barges.—The 600 by 110-foot locks of the Ohio, Illinois, and Upper Mississippi Rivers are generally accepted as adequate for the type and volume of commerce seeking these waterways. It follows that the logical trend toward standardization of barges calls for the adoption of such dimensions that when assembled in tow formation they fill the lock chambers with a minimum waste of available space therein. The 195 by 35 by 11-foot barge designed to carry 1,200 to 1,400 tons, which statistics show to be increasing in number, seems to fulfill most of the above requisites. It is not practical, however, for use on streams provided with 360 by 56-foot locks. The older and still more popular size which is adapted to both types of lock is the 175 by 26 by 11-foot barge designed to carry 800 to 1,000 tons cargo.

A type of moulded self-propelled craft in general use on the Atlantic Intracoastal Waterway and the New York State Barge Canal has advantages of speed, stability in rough water, and independence from dock loading and unloading facilities. Its disadvantages for use on inland rivers are limited cargo capacity and relatively excessive lockage requirements.

Judging future trends by past changes and the conditions likely to affect them, it seems safe to predict that although various larger size units will continue and perhaps increase in use for special types of cargo on certain waterways, the greater portion of inland waterborne tonnage will be moved by the two above-mentioned medium size barges. Lock dimensions for new works and replacements may be expected to conform with multiples of one or the other of these barge sizes. Research is constantly being directed toward technological advances in the further reduction of waterway transportation costs.

The Great Lakes

No treatise on inland waterway transportation in the United States would be complete which ignored a reference to the Great Lakes system of inland water transportation. It is true that channel widths and depths on the Great Lakes set them apart from either ocean navigation or from the standard 9-foot navigation on our other important inland waterways, yet they have important outlets to the Gulf of Mexico via the Illinois-Mississippi Waterway and via the St. Lawrence River and the New York State Barge Canal to the Atlantic seaboard.

As nature left them the Great Lakes have always been suitable for navigation. Connecting channels, however, were inadequate for through navigation, and the few natural harbors that did exist were of little commercial value. It was not until adequate connecting channels were provided for through navigation between the lakes that the full benefit of this great inland water route could be realized. Sensing the potentialities of interlake commerce the State of Michigan, in 1855, constructed a canal at Sault Ste. Marie—the "Soo" as it is commonly termed—at which point through navigation between Lakes Huron and Superior had been obstructed by the falls in the St. Marys River. Prior to this, in 1829, the Welland Canal had been constructed by Canada to provide a link between Lake Ontario and Lake Erie.

Rapid expansion of commerce on the Great Lakes followed soon after the completion of these connecting channels and a few years after the Soo was opened for navigation, vessels had so increased in number and size that it became apparent that provision for sheltered anchorages must be made. The gross tonnage of vessels of American registry operating on the Great Lakes increased from 454,000 tons in 1868 to 2,575,000 tons in 1935, and the average size from 178 tons per vessel to 1,000 tons and over. In 1935 there were 550 vessels of 1,000 gross tons or over flying the flag of the United States.

To meet the demand for better harbors the Federal Government, in cooperation with the municipalities and vessel operators, assumed responsibility for the work of improvement. Continuous progress has been made and the Great Lakes system now has, in addition to connecting channels of 25 feet or more in depth

downbound and 21 feet upbound, adequate harbors to accommodate the largest lake vessels.

Although maintenance of channels and harbors is now largely the responsibility of the War Department, several other Government agencies assist in providing aids to navigation on the Great Lakes. Included among these are the Coast Guard, the Weather Bureau, and the Coast and Geodetic Survey. Similar work is performed on the other side of the boundary by the Canadian Government.

Commerce on the Great Lakes is characterized chiefly by the bulky nature of the commodities carried and by long-haul movements. The principal items of freight are grain, iron ore, and coal, and the average haul about 800 miles. United States commerce on the lakes during 1939 amounted to 135 million tons. During the same season traffic passing through the St. Marys Falls Canal, which is indicative of interlake commerce, totaled 70 million tons. It is through this canal that the iron ores of Lake Superior flow down to the steel mills at the foot of Lake Michigan and to those adjacent to Lake Erie. The greater portion of the wheat crop of Canada and the northern tier of States also passes through the Soo en route to the Atlantic seaboard.

Private and contract carriage predominate on the Great Lakes. Package freight has not been heavy and no unusual provision has been made for terminal or storage facilities for this traffic. Bulk-freight terminals, however, and particularly their equipment for loading and unloading iron ore, are unsurpassed anywhere in capacity and in economy and efficiency of operation.

The ability to handle the enormous traffic on the Great Lakes is due largely to the efficient types of vessels used in the trade. These vessels are self-propelled units ranging from 1,000 tons upward. Among the special types are self-unloaders, automobile carriers, tankers, and motorships designed for use also on the New York State Barge Canal. Principal characteristics of the more recently constructed lake vessels are: Length, 600 feet; beam, 60 feet; speed, 12 miles per hour; gross tonnage, about 8,000; capacity, approximately 11,000 tons on a draft of 19 feet.

Considering that lake fleets are able to operate for only 8 months in the year; that recurring seasons of slack business tie up many vessels; and that two-thirds of westbound Lake Superior vessels are light because of lack of westbound cargo, the cost of transportation is remarkably low. Expressed in mills, the following line-haul rates on the principal dry cargo movements on the lakes present a fair idea of this low cost of transportation:

	Mill per ton-mile
Grain	0.7 to 1
Iron ore	.8
Coal	.5

The rates on grain are subject to constant fluctuation, whereas iron ore and coal rates are normally stable. For example, during the past three seasons the rate on grain from Duluth-Superior to Buffalo ranged between 67 cents and $1 per ton for the 986-mile haul. On the other hand, the rate on iron ore between the same ports has been 70 cents per gross-ton for many years prior to 1937. Beginning with 1937, the rate advanced to 80 cents. The lowest rate on the lakes is that applying on coal, which some of the vessels take as return cargo. The coal rate, like that on ore, is stable, having been 45 cents per net ton from Lake Erie to principal Lake Superior ports for many seasons.

The efficiency of the Great Lakes system of transportation has been achieved primarily through the cooperative efforts of the Federal Government, municipalities, railroads, industries, and vessel operators. Although adequate harbors, connecting channels, termi-

TABLE 4.—*The Great Lakes System*

Lake	Drainage of lake surface	Drainage area including lake surface	Mean level above mean tide at New York	Drop in elevation from next lake above	Size			Outlet		
					Length	Breadth	Maximum measured depth	River	Length	Project depth
	Sq. miles	*Sq. miles*	*Feet*	*Feet*	*Miles*	*Miles*	*Feet*		*Miles*	*Feet*
Superior	31,820	80,900	602.25		383	160	1,290	St. Marys	63	Upbound 21. Downbound 25.
Michigan	22,400	69,040	580.76	21.49	321	118	923	St. Clair	40	Locks 24.3.[1] Upbound 21. Downbound 25.
Huron	23,010	72,420	580.76	21.49	223	101	750			
St. Clair	460	6,420	575.30	5.46	18.5		25	Detroit	31	Upbound 21. Downbound 25.
Erie	9,940	34,680	572.33	2.97	240	57	210	Niagara	[2] 27.6	25–27.[2] 8 locks, 30 feet.
Ontario	7,540	34,630	246.00	326.33	180	53	774	St. Lawrence	183 to Montreal	St. Lawrence canals, 22 locks, 14 feet draft.

[1] Davis Lock and Fourth Lock have a depth of 24.3 feet on upper sill. Poe Lock has depth of 21.8 feet. In addition to the 3 locks normally in use on the United States side, there is 1 lock on the Canadian side having a depth on sills of 17 feet.
[2] Welland Ship Canal overcomes Niagara Falls.

Source: "*Transportation on the Great Lakes*," Corps of Engineers, U. S. Army, and *Annual Report, 1939*, Chief of Engineers, U. S. Army.

nal and dock facilities have continuously been maintained to keep pace with increasing traffic there has never been any overexpansion of facilities nor has there been any wasteful expenditure of funds beyond the necessary requirements of commerce. The efficiency of the system has been the result of sound judgment and the application of good foresight in planning for the needs of commerce in the future.

Competition of Water Carriers With Other Forms of Transportation

The era of liveliest expansion of rail transportation occupied the half-century from 1830 to 1880, but the period of modern highway, waterway, and pipe-line expansion did not get under way until about 30 years ago. As these new-type utilities entered the field with the advantages of new types of equipment and new services, the older operators were spurred into the grimmest competition for every ton of freight available to these alternate forms of transportation. Opposing views as to the wisdom of this policy from the standpoint of both carriers and public present phases of the transportation problem most difficult to reconcile.

The competitive situation was vividly described by the chairman of the Interstate Commerce Commission in his address at Chicago, April 26, 1938:

> The railroads undertake to compete for traffic which some other kind of carrier can handle much more efficiently and economically, and the other carriers do the same under reverse conditions. At the same time the railroads keep up a warfare with each other, and so do the motor carriers and the water carriers. The result is that they all handle much traffic with little or no profit, or at an actual loss. Carriage for a supposed margin over so-called "out-of-pocket-cost" is becoming the rule instead of the exception, and it will only work as an exception.

Undoubtedly the problem is complicated by the fact that water carriers are enabled to operate at lower cost and to maintain lower rates than if they had to meet the costs of channels and locks out of their revenues. However, on the out-of-pocket-cost principle invoked by competitors these improvement costs disappear altogether, for many millions of tons could be added to present waterway cargoes without increasing the improvement or maintenance costs at all. Whatever the final objective of the overland carriers may be in instituting competitive rates at or less than cost, the most confusing result is that a very substantial volume of barge-adapted tonnage is kept off the waterways by the uneconomic rates established by competitors, and distorted cost statistics result. The fact that the merits of the case can never be conclusively established to the satisfaction of all competing agencies unless the rates of all carriers are fixed at levels covering full costs does not justify placing artificial handicaps on barge-line service. The justification of navigation improvements at public expense must rest upon a demonstration of public benefits sufficient to offset the cost.

The speed and power of modern towboats, the increasing dependability of channels, and the scientific design of special-purpose, deck-house, and double-bottom barges tend to facilitate in greater measure the prompt, safe, economical handling of high-class commodities such as coffee, sugar, soap, rubber, cotton, sisal, canned goods, packaged cereals, crated beverages, dried fruit, paper products, vehicles, and machinery. There is no question, however, but that inland waterway transportation makes its greatest contribution to national welfare in moving bulk freight at low cost, and that in this field under present conditions it is preeminent as long as necessary fuel and raw materials must be assembled at points of use from sources remote from each other. Waterways make possible the optimum compromise in location between the various sources of supply and the markets. This service has a most profound and vital effect upon the efficiency of the national industrial system.

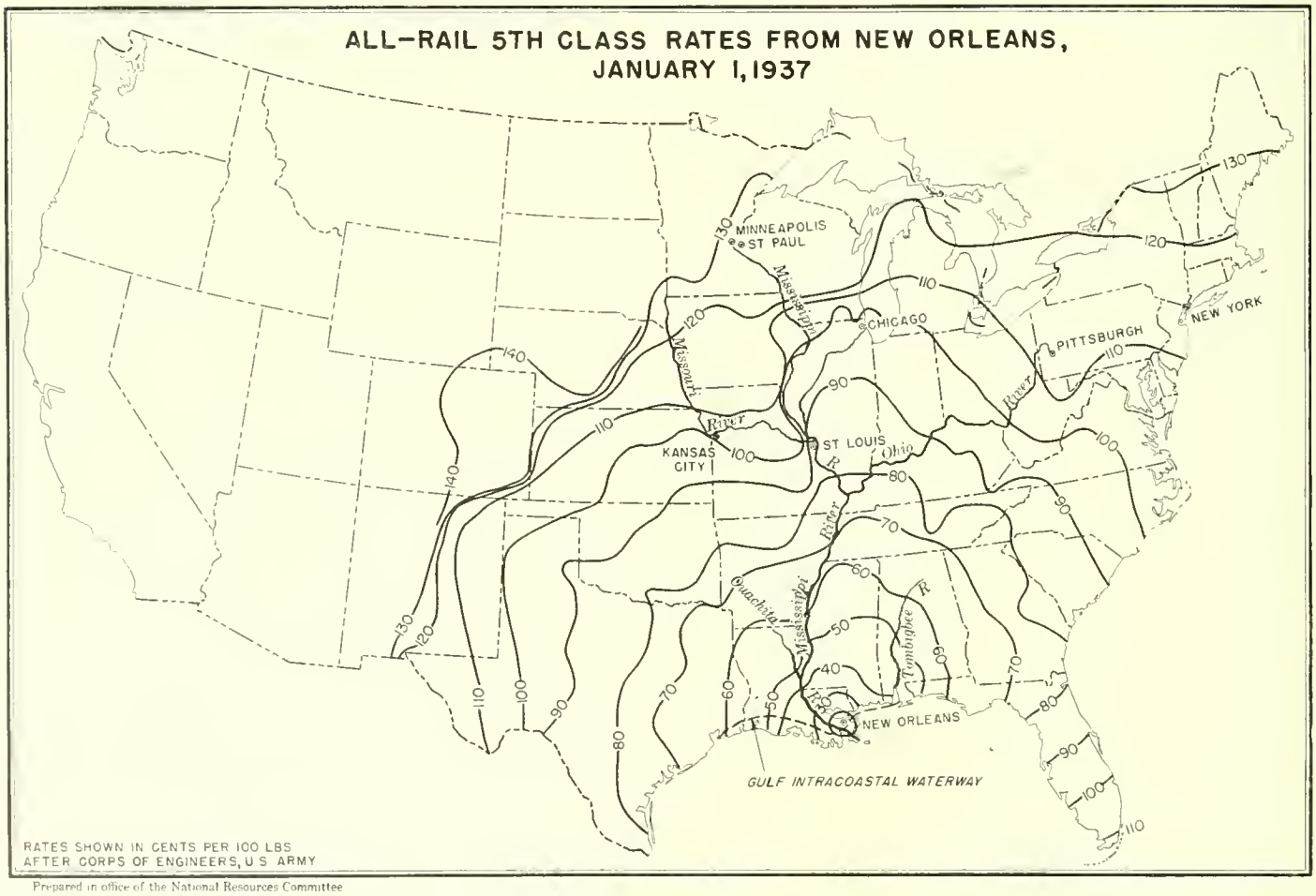
As previously indicated, water carrier competition is not limited to communities along the river banks but through interchange facilities with rail and motor carriers, extends inland from river ports. In the case of petroleum products the radius of economical truck distribution from river terminals ranges up to 300 miles. Wheat is drawn to the Mississippi System from more than 200 miles out in the Grain Belt. Pipe and other manufactured goods from the Pittsburgh and Chicago mills move by waterway to Memphis, Vicksburg, and Houston, whence overland delivery is effected into the riverless Southwest 500 or 600 miles. Economical joint barge-rail and rail-barge rates in effect make available such economies as are afforded by inland common carrier barge service over a large part of the continental United States.

The most important elements of competition between inland water carriers and other forms of transportation are time, distance, accessibility, convenience, completeness of service and charges. Water carriers are usually at a disadvantage with respect to all but the last item. Unquestionably, average water carrier service is slower, subject to more frequent and prolonged interruption from floods, fog, drought, and ice, more circuitous, and more dependent on supplementary services for initial collection and final delivery of freight than are overland competitors. Especially on substandard improvements, water carrier operations are likely to be irregular, inefficient, and expensive. When they do fit the demand, however, the economies are genuine and substantial. Where the basic industrial set-up is predicated fundamentally on water movement,

such as in oil distribution, coal, ore and sulphur mining, grain storage and milling, steel, cement, and paper manufacture, the convenience, efficiency, and cost differentials are all in favor of water. The custom of penalizing water transportation with heavy arbitrary differentials for time, circuity, and extra terminal expense in appraising its competitive position therefore merits close scrutiny in the above types of service. While it is true the delivery of high class rail freight has been greatly stepped up to meet motor truck competition, barge-adapted freight will not stand the cost of "red ball" fast freight service. Prejudicial distance comparisons must also be guarded against, as rail and truck freight also travels by circuitous routes.

Investigation by the War Department indicates that inland river barge lines rarely if ever establish rates unprofitable to themselves although they appear to thrive on rates unprofitable to their competitors. There is neither the opportunity nor the desire on the part of the great mass of inland water carriers to use the privilege of making out-of-pocket-cost rates. It is not a weapon they can use to advantage. Practically every ton of barge-adapted freight can be hauled by other means at some price. Inland waterway carriers cannot, therefore, shift the revenue burden onto some reservoir of tonnage exclusively their own, should they wish to institute below-cost rates on some particular block of competitive traffic. They would lose their profit on one while losing the other altogether. Freedom of the waterways to use by any soundly established legitimate transportation enterprise exercises a wholesome deterrent against excessive charges, and the necessity for survival prescribes rates that include an adequate profit. As long as agencies competing with water can afford to maintain uneconomic rate scales, large volumes of barge-adapted tonnage are prevented from seeking the water routes, but otherwise the effect of competition on barge line rates may be described as negligible.

The effect of competition on the rates of competitors is profound. The cost of service is not the governing factor in fixing the rates of competitors with water transportation. Only in the aggregate of all freight charges do the railroads attempt to maintain a margin



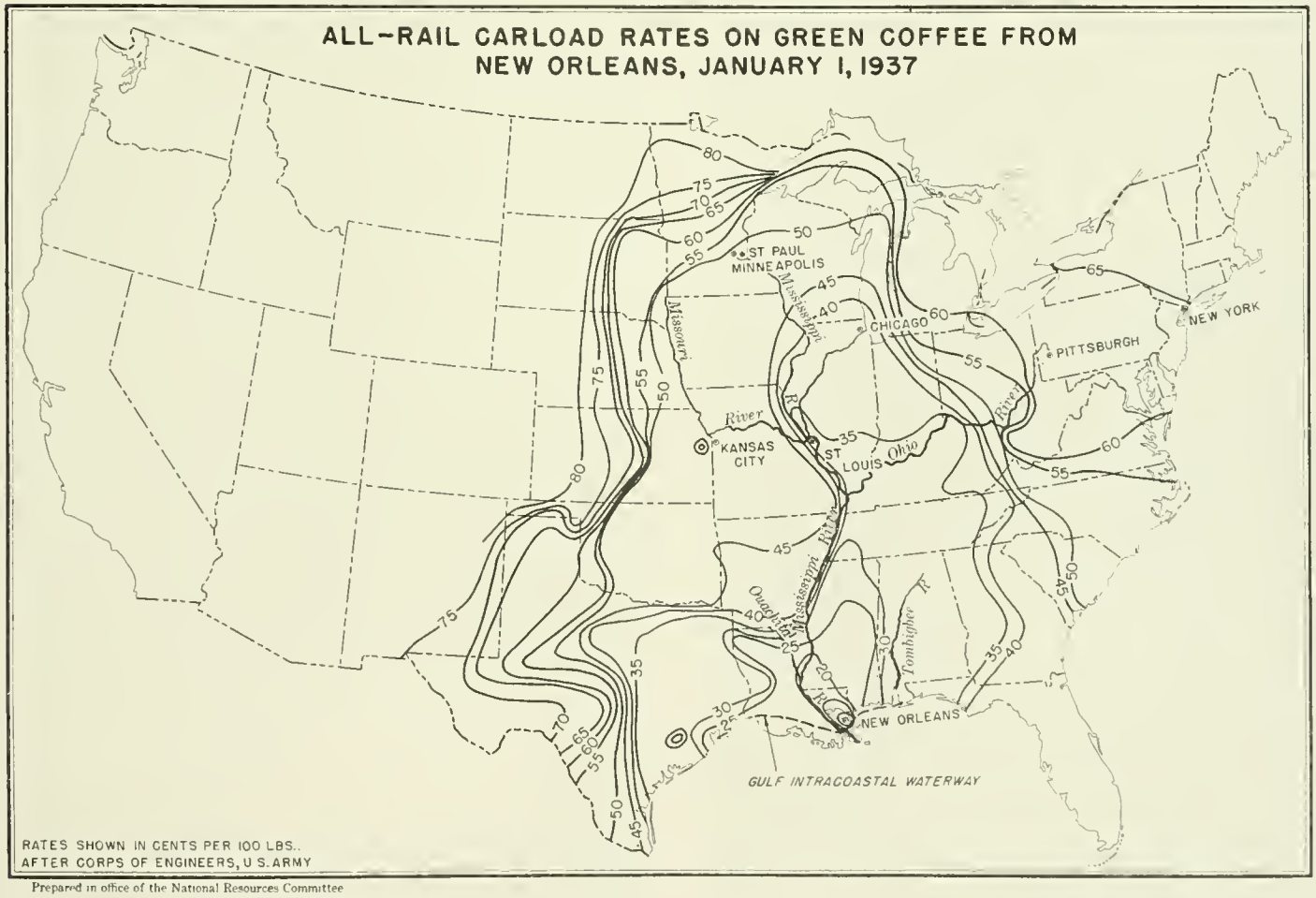
Prepared in office of the National Resources Committee

FIGURE 40

of revenue over expenses. This is bound to cause inequalities and discrimination. Unlike motor carriers, which skim the cream of high rated, high class traffic, inland water carriers aim for the most part at low class, low revenue type of freight. This class of tonnage, although highly profitable in the aggregate at normal rates because of its volume, does not by any means pay its pro-rata share, ton for ton, of total railroad expenses. A heavy volume of such traffic is always found traveling by rail in spite of water rate differentials because of speed, completeness, and other inherent superiorities of rail service. When these normally low rail rates on heavy, bulky goods are depressed below the narrow margin of profit for competitive purposes it is the total port-to-port rail traffic in those commodities, not merely the part which would otherwise be diverted to water, that causes a depletion in revenues the railroads can ill afford to lose.

From a canvass of the area tributary to the Warrior-Tombigbee Waterway in 1935 and from freight tables submitted to the War Department by the 13 railroad companies serving that area it was computed that 87½ percent of the freight economically adapted to movement by the waterway actually continued to move by rail at "water-compelled" rates and only 12½ percent of that potential tonnage actually sought the water route. On such a division of traffic the revenue losses greatly surpassed that on the water-borne tonnage alone. When it is remembered that freight held on the rails by depressed rates could travel as provided for by waterway at a profit to carrier and shipper alike, the economic loss to the public as well as to the carriers becomes manifest. The claim of so-called savings to the shippers by reason of the depressed rates has no valid economic defense. If the economic justification of the waterway was properly analyzed in the first place, there is a sound reason why freight for which it was provided should make use of it in preference to a costlier means of transport.

The effect of river carrier competition on rail freight rates is graphically illustrated on the two accompanying rate contour maps. Fig. 40 shows the reach of all-



Prepared in office of the National Resources Committee

FIGURE 41

rail class rates from New Orleans inland on commodities for the most part unadapted to water and not moving in barge-lot volume. Fig. 41 shows the reach of all-rail rates on green coffee, a barge-adapted commodity, as adjusted to meet all-barge and barge-truck competition from New Orleans into the interior.

The most disastrous effect of the current system of permitting high cost, high grade carriers to compete, by means of unremunerative rates, with low cost, low grade carriers for low grade traffic, is the diversion from waterways, without profit to anybody, of traffic which they could serve adequately and economically. In thus curtailing water-borne tonnage it produces misleading unit cost statistics applied to the provision of channels and locks—statistics which are used with skill and effectiveness by opponents of the national waterway policy. Viewed realistically, the objective of competitors in establishing out-of-pocket-cost rates is not merely to meet water competition. The permanent maintenance of unprofitable rates would drain their resources, rather than feed their revenues. The only objective justifiable from the viewpoint of private enterprise would be the final bankruptcy of the water carriers and the elimination of their competition followed by the restoration of monopoly and a reversion to the higher scale of freight charges. The renewal of competition would be effectively discouraged by the threat of a repetition of the tactics now sanctioned. The chairman of the Interstate Commerce Commission in his testimony before the House Committee on Interstate and Foreign Commerce (H. R. 2531, 1939), said:

> The minute a waterway is constructed and the water carriers begin to inaugurate low rates, then the railroads reduce their rates. The public gets the benefit of those reductions but the waterway does not get the benefit of that traffic; and if you included all the traffic on all the reduced rates for which waterways were responsible, there would be a very different showing.

Assuming the validity of the estimates of tonnage potentially available and adapted to movement by barge, water-borne tonnage figures will swell to the predicted volume when and if permitted freely to seek the water routes, uninfluenced by competitive rate depression until it can once become established. The cost to the public per ton-mile can then be fairly measured against the estimates upon which the improvements were justified and authorized, and if the public interest requires it, the test can then be applied to determine whether the resulting water-borne commerce can carry its share of the improvement cost. It can hardly be denied that it is at least partly to forestall that comparison that competitors with the inland water routes so invariably resort to the temporary sacrifice of their revenues to hold the contested traffic.

Justification of Waterway Improvements

Benefits and Disadvantages of Inland Water Transportation

The preceding paragraphs have stressed the evils growing out of competition among the different types of carrier. Inland water transportation facilitates a kind of competition that is beneficial to the producing and consuming public. This is termed market competition, though a broader term would be more appropriate. Directly and through its connections it enables different commodities such as oil and coal to compete with each other in a common market and it enables each producing area to compete in different markets. The factor responsible for these results is the net economic saving in moving the freight by waterway.

Ignoring, for the moment, the balance between consequential benefits and damages and the more abstract social values, the net economic saving made possible by the provision of inland water transportation rests on the difference in entire cost of performing the service by waterway and the cost of performing the identical service by the next most economical available means. There is reasonably close agreement among transportation authorities as to the average unit carrier costs of transporting barge-adapted commodities by railroad, motor truck, and pipe line as well as by waterway. It is only necessary to determine the ton-mileage to which the cost differentials should properly apply, and to deduct the public cost of providing and maintaining the improvement from the product to obtain the net economic savings. If agreement could be had on the volume of traffic involved, the computation of savings would be a fairly simple clerical operation for any given project.

Limitations of water-carrier service.—The general statement, so frequently heard, that inland water transportation costs less and is worth less than other means of moving freight, is subject to qualifications. It is necessary to recognize that services which can be performed by water carriers alone are limited and cannot always be compared with rail- or motor-carrier service on an equal basis. Barge lines cannot reach many points accessible to their competitors except through interchange with those agencies. Extra transfer and terminal handling costs are often incurred in offsetting these limitations and this extra expense must be considered in a comparison of service costs. Although terminal conditions are not always in favor of the overland carriers, the limitations in convenience are most often with the water routes and these disadvantages have been allowed for in the statistical comparisons herein made by adding terminal and transfer differ-

entials actually found to apply to the cost of the movements.

It is important to make sure that the estimated cost differentials thus applied fairly represent inherent differences in the cost of the service under analysis and not merely some general theoretical assumption. In industrial boat-line operations and through barge-lot freight service the large-scale specialized mechanical handling of freight at barge terminals and interchange ports is simpler and less costly than the average intermediate yardings and classification of freight cars and the servicing of motortrucks. This is particularly true of water-front interchange at ports where elaborate and costly interswitching as well as truck haulage through congested streets can be avoided by use of water service.

A condition under which inland waterway transportation in northern latitudes finds itself at a distinct disadvantage is the closure of the channels by ice during the winter months. This entails relinquishment of commerce that must move throughout the year. As considerable difficulty is involved in its recovery and stand-by service of some other type must be provided, savings on commodity movements of that nature on waterways such as the Upper Mississippi are subject to substantial discount. Too much emphasis, however, can be, and often is, placed on this disability. The great preponderance of barge-adapted tonnage of the class of ore, grain, coal, and oil does not require elaborate stand-by capacity in overland transport facilities because it is readily adjusted to seasonal haulage and can be stored in elevators, tank farms, and stock piles for carrying over the closed season.

Indirect influence of waterways.—There is nothing fixed or static about the total volume of freight to be moved. Tonnage carried by one form of transportation is not necessarily diverted from another form. It is a generally accepted premise among transportation authorities that low rates promote the development of resources and stimulate new commerce while high rates have the opposite effect. In fact, although an increase of commerce and its attendant benefits are the direct results of savings in transportation rates, increased volume makes for further economies and rate reductions can be pyramided by reason of progressive decreases in unit cost of transportation corresponding to each increment of tonnage.

Economic Analyses of Proposed Waterways

A basic principle to be applied to the appraisal of waterways is that the initial cost of such improvements is an investment of a part of its resources by the public, and that, to be economically justified, the waterway must be capable of realizing in transportation savings and other benefits, an adequate return on that investment widely enough distributed to be generally beneficial. An adequate return must cover at least the actual operating and maintenance charges and reasonable assessments for interest, depreciation and obsolescence of navigation works.

This basis of appraising the public value of a contemplated waterway improvement is a measure of its capacity, as revealed by survey, to justify itself in actual performance, but not, of course, an assurance that it will do so. It is the only sound method of determining the comparative merits of proposed improvements under the prevailing system of effecting traffic distribution. Some waterways have exceeded traffic estimates; many have not yet approached very closely the expected volume. The much discussed competitive manipulation of rates to prevent water-adapted commerce from seeking its most economical means of transport is widely recognized as unnecessarily harmful and therefore can be considered temporary in its effect. It is necessary, of course, to weigh all known factors which may, in the light of experience, be expected to affect the future situation in the attempt to determine whether all the benefits from the improvement, direct and indirect, tangible and intangible, actual and potential, will in the long run be sufficient to offset the costs and the damages and to repay to the public the required investment of public funds.

Economic Analyses of Completed Waterways

In addition to river basin surveys for multiple-purpose development and surveys of specific proposed improvements, the Corps of Engineers has more or less continuously under way a series of economic analyses of completed navigation projects. The purpose of these studies is to determine the extent to which typical improvements have attained economic justification in order to provide and maintain a currently sound basis for estimates and recommendations required of the Department with respect to proposed improvements. The approach to these analyses differs fundamentally in one major respect from the statistical method adopted in recent briefs by opponents of waterways. This latter method takes a cross-section of current statistics pertaining to a project at any time without regard to the stage of its completion. Annual charges computed on accumulated expenditures for unfinished as well as finished structures are sometimes superimposed on expenditures for original structures already abandoned or replaced to obtain the current improvement costs. Carrier costs are added and unit costs derived by dividing the combined annual charges

by the current ton-mileage of freight which finds its way to water in spite of the determined efforts of competitors to head it off at any cost. The resulting unit costs have been frequently compared with competitively depressed rates used as though they represented full costs of the competing agencies. It would seem superfluous to point out such obvious incongruities were not this the method of analysis and appraisal employed in current technical periodicals and in textbooks of recognized academic authorities on transportation economics.

For example an appraisal of Federal waterways made by the "cross-section" or "trial-balance" method as of the year 1934 would show the unit cost per ton-mile of navigation improvements for the Illinois Waterway as 10 times the cost on the Ohio, and even more fantastic multiples for some more recent projects still farther from completion. As a matter of fact all these major links of the standard inland system, the Illinois, the Upper Mississippi, the Tennessee, the Warrior, are or will be practically identical in standard dimensions of channel and locks with ample volumes of potential barge traffic adapted and available to tax the capacity of each project. Fleet operating requirements and technique are similar and the cost of conducting transportation the same. The difference in 1934 would lie in the fact that the Ohio River improvement had been completed and open to water-borne commerce for several years, while the Illinois and other waterway improvements were in the midst of the most obstructed stage of construction activity and not open to continuous navigation. As predicted in preliminary estimates for the Illinois project, commerce has increased 1,500 percent in the last 7 years as it progressed toward completion. During the construction stage navigation channels are impeded by cofferdams and construction plant and at no time during such active construction is there any logical relationship between existing water-borne traffic and the amount of money being expended on the improvement. The expression of one in terms of the other can serve but to mislead the unwary statistician.

Economic Analyses of the Ohio River 9-foot Canalization Project

The existing project on the Ohio River providing 9-foot controlling depth throughout its 981 miles of channel, with lock chambers 600 feet long by 110 feet wide, was recommended by a special survey board of Army Engineers in 1905. The project was authorized in 1910 and completed in 1929. Because it has been completed long enough for its traffic to become fairly well stabilized and not because it is unique in any particular respect, the Ohio River improvement is selected for analysis as a typical major inland waterway project. Prior to 1905 the river had been under open channel improvement, alternating with a few shallow draft slack-water sections. Analysis of available records indicates that the somewhat primitive type of improvement had amply repaid the public money expended thereon. By 1905, however, its navigation facilities had become almost hopelessly outmoded. Minimum depths in several sections were reported as not over 2 feet and the waterway was proving too limited and hazardous to meet the growing demands of industry for adequate, efficient, continuous barge service on the volume scale required. It was evident that a dependable improvement of the open channel type was not feasible. The waterway was not only becoming incapable of providing transportation savings on water-borne tonnage, it was on the point of losing its tonnage to rail trunk-line extensions newly laid along its banks. With a few isolated structural exceptions the Ohio was about to become obsolete as a waterway and the problem was whether the prospective benefits of a new 9-foot canalization project warranted a recommendation for its adoption. Neither the public money thus far sunk in its improvement nor the savings previously earned had any present bearing on the question confronting the War Department. The expenditures and the commerce prior to 1905 are therefore written off, and the analysis begins with the date of the decision to provide the existing 9-foot project with continuous all-season slack-water pools and locks adequate for heavy traffic.

A rigidly logical analysis according to War Department standards would bar the inclusion of savings during the earliest years of the construction period until the first series of navigation structures had removed the worst hazards and had begun to facilitate navigation. As an offset it would also ignore the capital expenditures since 1929 as not constituting essential features of the project, and as not yet having had time to affect contemporary commerce. Construction methods adopted to encourage such contemporary navigation as could be accommodated added quite heavily to the cost. A rigidly mathematical year-to-year comparison of expenditures and savings has been preferred in the accompanying tabulations and graphs, though subject to the adjustments just described, because it shows clearly the adverse effect of heavy, costly construction on contemporary traffic, and indicates the characteristic lag of increments in tonnage and savings following major improvement programs.

In table 5 the procedure has been to compare annual charges against the improvement (consisting of items covering annual operation and maintenance, depreciation, interest during construction and interest on investment) with annual savings in trans-

TABLE 5.—*Economic Analysis of the Ohio River Canalization Project*

[In thousands of dollars]

Year	Annual capital expense			Cumulated capital expense			Annual charges					Annual gross savings	Profit or loss (column 12 minus 11)	Interest, 4 percent on column 15 [1]	Cumulated profit (including column 14)	Percent annual return, column 13–6	Percent cumulated return column 15–6
	Works subject to depreciation	Other works	Total (columns 1 plus 2)	Works subject to depreciation	Other works	Total (columns 4 plus 5)	Operation and maintenance	Depreciation, 1 percent on column 4 [1]	Interest, 2 percent on columns 3 plus 7	Interest, 4 percent on column 6 [1]	Total (columns 7 to 10)						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1905	$906	$50	$956	$906	$50	$956	$267	$0	$24	$0	$291	$3,028	$2,737	$0	$2,737	286.3	286.3
1906	1,102	72	1,174	2,008	122	2,130	203	9	28	38	278	3,049	2,771	109	5,617	130.1	263.7
1907	1,736	48	1,784	3,744	170	3,914	231	20	40	85	376	3,056	2,680	225	8,522	68.5	217.7
1908	1,225	90	1,315	4,969	260	5,229	236	37	16	157	446	2,390	1,944	341	10,807	37.2	206.7
1909	1,751	284	2,035	6,720	544	7,264	268	50	46	209	573	2,139	1,566	432	12,805	21.6	176.3
1910	1,147	134	1,281	7,867	678	8,545	257	67	31	291	646	2,443	1,797	512	15,114	21.0	176.9
1911	1,544	148	1,692	9,411	826	10,237	280	79	39	342	740	3,096	2,356	605	18,074	23.0	176.6
1912	1,992	290	2,282	11,403	1,116	12,519	382	94	53	409	938	1,919	981	723	19,778	7.8	158.0
1913	2,306	383	2,689	13,709	1,499	15,208	395	114	62	501	1,072	2,160	1,088	791	21,657	7.2	142.4
1914	4,267	261	4,528	17,976	1,760	19,736	386	137	98	608	1,229	1,690	461	866	22,984	2.3	116.5
1915	7,351	427	7,778	25,327	2,187	27,514	454	180	165	789	1,588	1,609	21	919	23,924	.1	86.9
1916	4,982	178	5,160	30,309	2,365	32,674	546	253	114	1,101	2,014	1,222	−792	957	24,089	−2.4	73.7
1917	3,539	186	3,725	33,848	2,551	36,399	552	303	86	1,307	2,248	933	−1,315	964	23,737	−3.6	65.2
1918	3,129	25	3,154	36,977	2,576	39,553	829	338	80	1,456	2,703	1,146	−1,557	949	23,129	−3.9	58.5
1919	4,737	67	4,804	41,714	2,643	44,357	973	370	116	1,582	3,041	1,029	−2,012	925	22,042	−4.5	49.7
1920	5,151	29	5,180	46,865	2,672	49,537	1,049	417	125	1,774	3,365	2,441	−924	882	22,000	−1.9	44.4
1921	6,599	0	6,599	53,464	2,672	56,136	1,349	469	159	1,981	3,958	2,165	−1,793	880	21,087	−3.2	37.6
1922	4,460	0	4,460	57,924	2,672	60,596	1,410	535	117	2,245	4,307	2,014	−2,293	843	19,637	−3.8	32.4
1923	5,172	51	5,223	63,096	2,723	65,819	1,798	579	140	2,424	4,941	2,748	−2,193	785	18,229	−3.3	27.7
1924	5,748	373	6,121	68,844	3,096	71,940	1,788	631	158	2,633	5,210	3,405	−1,805	729	17,153	−2.5	23.8
1925	8,173	42	8,215	77,017	3,138	80,155	2,100	688	206	2,878	5,872	5,706	−166	686	17,673	−.2	22.0
1926	8,465	0	8,465	85,482	3,138	88,620	2,151	770	212	3,206	6,339	6,544	205	707	18,585	.2	21.0
1927	6,743	351	7,094	92,225	3,489	95,714	1,744	855	177	3,545	6,321	7,568	1,247	743	20,575	1.3	21.5
1928	9,619	410	10,029	101,844	3,899	105,743	2,132	922	243	3,829	7,126	8,677	1,551	823	22,949	1.5	21.7
1929	5,195	607	5,802	107,039	4,506	111,545	2,121	1,018	158	4,230	7,527	10,277	2,750	918	26,617	2.5	23.9
1930	1,236	3,053	4,289	108,275	7,559	115,834	2,620	1,070	138	4,462	8,290	10,092	1,802	1,065	29,484	1.6	25.5
1931	566	2,006	2,572	108,841	9,565	118,406	3,138	1,083	114	4,633	8,968	10,029	1,061	1,179	31,724	.9	26.8
1932	979	−73	906	109,820	9,492	119,312	4,054	1,088	99	4,736	9,977	8,746	−1,231	1,269	31,762	−1.0	26.6
1933	1,224	−310	914	111,044	9,182	120,226	4,806	1,098	114	4,772	10,790	10,356	−434	1,270	32,598	−.4	27.1
1934	1,475	291	1,766	112,519	9,473	121,992	3,776	1,110	111	4,809	9,806	12,359	2,553	1,304	36,455	2.1	29.9
1935	2,084	596	2,680	114,603	10,069	124,672	1,773	1,125	89	4,880	7,867	14,321	6,454	1,458	44,367	5.2	35.6
1936	1,660	0	1,660	116,263	10,069	126,332	2,705	1,146	87	4,987	8,925	17,570	8,645	1,775	54,787	6.8	43.4
1937	1,051	0	1,051	117,314	10,069	127,383	4,148	1,163	104	5,053	10,468	16,375	5,907	2,191	62,885	4.6	49.4
1938	1,442	0	1,442	118,756	10,069	128,825	4,141	1,173	114	5,095	10,523	15,933	5,410	2,515	70,810	4.2	55.0
1939	260	0	260	119,016	10,069	129,085	4,798	1,188	105	5,153	11,244	20,420	9,176	2,832	82,818	7.1	65.2
1940	99	341	440	119,115	10,410	129,525	4,764	1,190	104	5,163	11,221	22,395	11,174	3,313	97,305	8.6	75.1

[1] For previous year.

Source: Statistical records, Office, Chief of Engineers, U. S. Army.

portation cost. The difference is taken as the annual net profit or loss to the public on the venture. The latter item, as well as that of capital expense, has been accumulated through the 25 years of the construction period and through the following 11 years. At the close of the fiscal year 1940, the tabulation shows that interest on the capital investment at 4 percent, and amortization on a 40-year depreciation basis, as well as operating and maintenance costs, have been met out of savings in transportation charges. In addition, the project has to its credit an accumulated surplus in net public savings of $97,305,000. These savings of $97,305,000 include interest at 4 percent, the same rate as that applied to capital investment, figured yearly on the accumulated net surplus in the "profits" column.

The capital expenses, starting with 1905 and accumulated yearly through 1940, are show in columns (4), (5), and (6) of table 5. Expenses on works subject to depreciation are shown in column (4) and the annual charges for depreciation against these amounts are given in column (8). This depreciation factor of 1 percent is adopted theoretically to recover depreciation of the locks and dams in 40 years. Column (9) represents the item of interest during construction, assumed at 2 percent on the total money spent during each year. Interest on investment, column (10) is figured at 4 percent. Likewise, interest on "cumulated profits," column (14) is taken at 4 percent. Column (12) annual gross savings, requires detailed explanation.

Gross savings were determined as the difference between the over-all cost of water transportation and the all-rail rate between points of origin and destination. The basic analyses of representative years were made by trained satisticians and traffic specialists working in the field, but it was found entirely impracticable to analyze every individual freight movement throughout the period studied. Typical movements of each principal commodity between key points in the representative groups of origins and destinations were analyzed under each significant change in the competitive situation. In the examples of joint or combination rail-water movements, the local rail rates to and from riverside and the appropriate extra terminal handling differentials were added to the cost of the water service in order to determine the over-all cost of water

transportation for comparison with all-rail rates, origin to destination. The savings factor per ton thus found was considered to have been earned throughout the entire length of water haul, and the savings factor per ton-mile derived accordingly. This ton-mile savings factor was then applied to the recorded ton-mileage of water haul of the particular commodity movement for each year of the period covered. The recorded ton-milage was obtained from the Annual Reports of the Chief of Engineers, United States Army. Each commodity was similarly studied, and computations made on an annual basis of all the savings on all the recorded commodity movements for posting in column (12) of the table as gross savings for the year. The cost of the water service was determined in some instances by empirical formula, but in the great preponderance of tonnage movements the working data were obtained directly from carriers and shippers in the field.

The economic analysis of the Ohio River project through the year 1934 has been given considerable publicity. Since that year the volume of tonnage on the river, as shown in the annual reports of the Chief of Engineers, U. S. Army, has increased substantially, while the rates of overland carriers have been adjusted to meet this competition. Consequently it was thought advisable to bring this study up to date by the same methods used in the original study. This procedure necessarily meant that consideration and due weight would be carefully given to any new factors which have entered the situation since 1934 which would affect savings in any way.

Such factors included instances where the saving per ton-mile by water was reduced on coal tonnage due to increased shipments to inland cities, necessitating the use of river-rail terminals. In other cases savings were increased, due to decreases in terminal handling charges on account of greater efficiency of unloading equipment. As regards iron and steel tonnage, the saving per ton-mile showed a decline during the past few years due to a drastic reduction in the applicable rail rates on movements from Pittsburgh, Pa., to Memphis, Tenn., and New Orleans, La. With the expansion of oil and gasoline commerce on the Ohio River much of it has to move through tributary waterways or on open channel waterways where operating costs are higher than on the Ohio River. This fact, together with the increased length of haul, has caused a decrease in saving per ton-mile since 1934. All of these changes and any other pertinent ones wherever applicable are reflected in the yearly savings as shown in the analysis.

In addition to including the years 1935 through 1940, the economic analysis of this project was further revised. This revision treated the "Cumulated Profits" as a bank savings account drawing interest continually on the annual balance, and each succeeding annual balance has been augmented by the accumulated interest thereon plus the annual profit or loss. It should be noted that the same percentage values for depreciation, interest during construction, interest on investments, and interest on profit have been used in the revised table as were used in the previous economic analysis of the project.

It will be noted that the period of heavy construction extended from 1910 to 1930 and that capital expenditures reached a peak in 1928. The table shows, column (12), that gross savings were realized each year of the 25-year construction period. However, column (13) shows that during the 13-year period 1914–26, when approximately 60 percent of the capital expenditure for locks and dams was made, net savings were shown in only 3 years. Of still greater significance, substantial net losses were recorded for 10 consecutive years during this period. Generally concurrent with this period of heavy expenditure there occurred the low level movement of traffic, shown in the following tabulation concerning commerce on the Ohio River:

Period (average):	*Short tons (thousands)*
1905–09	10,107
1910–14	9,107
1915–19	5,987
1920–24	8,026
1925–29	19,702
1930–34	18,003
1935–39	23,045
Year 1940	29,550

It will be seen that there was substantially decreased average commerce in each 5-year period during the 15 years 1910–24, compared with the prior 5-year average 1905–09 and with the subsequent 5-year average 1925–29. Without doubt the principal causes contributing to this subnormal freight movement were the growing obsolescence of the open channel improvement and the obstruction to navigation offered by the new cofferdams and other construction activities. Sudden fluctuations in stage were created and navigation retarded and restricted as to length of haul. For example, upon the opening of all facilities to 9-foot navigation in 1929, the average length of haul, although fluctuating, showed an unmistakable tendency to lengthen as may be seen in the accompanying tabulation:

Period (average):	*Length of haul (miles)*
1925–29	62.3
1930–34	88.8
1935–39	117.1
Year 1940	130.4

The method followed in the accompanying tabulation indicates the related fluctuations of expenditures and savings, and thus shows that proof of the soundness of a waterway improvement project must be deferred for a reasonable promotion period after construction has been completed. It also indicates the lack of economic significance of a quotient obtained by dividing expenditures in the midst of a construction period by contemporary traffic.

Regulation of Inland Water Transport

Until 1941, Federal regulation of inland waterways was confined to measures designed to promote safety in navigation and equitable relations between the water carriers, their employees, and their overland connections. The Transportation Act of 1940 extended the regulatory authority already vested in the Interstate Commerce Commission over rail, highway, and pipeline transportation to encompass similar control over water transportation. The demand for this legislation apparently originated, not with the shippers or the water carriers or the industrial and agricultural groups, but with the overland carriers who were experiencing difficulty in maintaining effective competition with the barge lines in their particular field. The act represents a swing in legislative policy from protection of the public against monopoly, for which regulation is adequate, to protection of the carriers against loss of revenue through competition, for which regulation alone is not adequate. Maintenance of an efficient transportation system on a sound, stable financial basis is highly desirable, but it is important to recognize the limitations of regulation as a means of accomplishing that end. Professor Kent Healy has aptly pointed out in "The Economics of Transportation in America" that a regulatory body cannot arbitrarily set the level of transportation charges and at the same time enforce the purchase of enough transportation to assure an adequate return on carrier investment.

Equal regulation of all forms of transportation has an equitable sound, but no amount of Federal control can fairly equalize essentially dissimilar services, offset the advantages or disadvantages of location, or compensate for the faulty conception, improvident design, wasteful management, or gradual obsolescence of carrier facilities. Experimental attempts to accomplish these ends through regulation may work irreparable injury to water transportation. In setting up machinery to effect an arbitrary distribution of traffic among the several kinds of carriers, the fact is likely to be overlooked that there is no fixed volume of commerce which may be expected to move regardless of fluctuations in the price of transportation. There is nothing static in the relative position of the different types of carrier. The interests of a kind of transportation handling 65 percent of the Nation's freight loom more portentous than those of a kind moving but 5 percent, and the natural tendency is to sacrifice the welfare of the lesser agency when interests clash. Evidence has been presented in this chapter, however, that water transportation fills a definite need and that the distribution of the traffic might be less disproportionate if the other carriers would desist from carrying tonnage at revenue levels profitable only to water carriers.

It is generally conceded that the national transportation plant is badly in need of coordination, but it is equally true that it is also in need of pruning. It is difficult for long-established agencies to acknowledge that the abandonment of unprofitable routes and the relinquishment of unprofitable tonnage to better-adapted competitors will, in the long run, strengthen rather than weaken the transportation system. In a superficial appraisal of relative indispensability, existing adequacy of transportation facilities in the narrow sense of physical capacity to move freight is prone to overshadow prospective economic efficiency and progress is thus retarded. In measuring comparative economy and efficiency for regulatory purposes, however, justice must be accorded the claim of overland carriers, the railroads in particular, that charges for barge-line service do not cover the cost of providing the channels. A fair method of adjusting that situation without sacrificing the public interest is recognized as an extremely difficult problem. Assuming that the principal inland waterway projects have been properly investigated, designed, and constructed, they represent a valuable public asset affording means of rendering needed transportation service with substantial savings. Experience has shown that a period of several years is required after the completion of each project for business and industry to adjust themselves to take advantage of new routes. Waterway carriers need time to develop the special facilities and technique that render their services particularly valuable. A certain amount of initial encouragement, protection, and freedom from burdensome restrictions is clearly required by pioneer river operators to offset the obstacles placed in the way of their establishment. During this period, competing agencies apparently deem it vital to their own interests to combat by every means at their command the normal growth of water-borne commerce. They demand of the regulatory agencies that water-carrier rates be required to cover a pro-rata share of the cost of channel improvements while themselves maintaining rates based on the out-of-pocket cost of "added traffic." On that basis it is clear that water carriers could dispense not only with their fixed charges and operating overhead in

establishing competitive rates but with channel costs as well because practically unlimited tonnage could be added without incurring any extra out-of-pocket expense to the Government for waterway maintenance or operation. Competing agencies must restore their own rates to fully compensatory levels yielding a fair profit on sound investment, and thus permit commerce freely to seek its own distribution, for their demands for water carrier regulation to merit compliance.

It is often mistakenly assumed that economy and efficiency in service are possible only to the larger and more regular transportation organizations. As the function of inland-waterway carriers is almost infinitely diverse it performs numerous highly specialized services, and some of the most efficient transportation is attained by the many small independent agencies operating on inland rivers. These small units are individually unable to maintain staffs of legal and traffic experts to defend their interests through protracted hearings or harassing litigation. It will be necessary to administer Federal control with a light hand to safeguard private initiative and enterprise and preserve for the public the inherent advantages of these numerous small but efficient units.

Inland Waterways and National Defense

Less than a generation ago conditions became so chaotic in the transportation field under pressure of an emergency that the preparation and prosecution of vital military measures were dangerously hampered because transportation facilities, previously regarded as adequate, bogged down. Undoubtedly we are profiting by the lessons of 1917 and 1918, but several types of carriers now occupy the field and responsible public officials are concerned lest the present transportation problem be dealt with in the light of the past as though it were again exclusively the problem of one agency. There is an inescapable and readily understandable tendency on the part of private transportation interests to be overly conservative in undertaking the financial burden of permanent expansion of facilities, especially roadway and other fixed property, in order to meet defense needs which may be only temporary. It is vitally necessary under these circumstances for the Government to make its own independent estimate of the adequacy of the existing transportation system and, if need be, to assume the burden of providing additional and alternate facilities to meet anticipated needs.

An accurate estimate of the military value of an individual waterway project is impossible. In time of war or threat of war the transportaion load will certainly be sharply increased and experience has taught that this increase will come not only in tonnage but even more in average length of the hauls. Not only must peacetime functions be continued and accelerated but facilities must be capable of rapid readjustment to handle tremendous loads of emergency tonnage on short notice between unaccustomed termini with efficiency and dispatch. The tonnage burden normally handled by coastwise and intercoastal vessels, for example, has already been thrown upon our inland transport system. The niceties of economic balance must give way to the consideration of the most critical situations which might arise.

No nation ever suffered or will ever suffer in time of war from too much transportation under its control. However rudely the ideologies of the aggressor nations may clash with our national concepts the most intensive study of the mechanics of their successful operations and their adaptation to our defense is a military necessity of first magnitude. Waterways of continental Europe handled 25 percent of the total internal freight in peacetime. With the more or less constant threat of war hanging over that continent for centuries, uneconomic practices and pressure from other types of carrier have not been permitted to retard or stifle their development. It has apparently been a continuing source of astonishment to visiting British economists that our many long, deep, potentially navigable rivers have not been brought to higher state of development and use. This situation has been attributed in their writing to a false appraisal of the true economy of inland water transport and to the effective opposition from competing transportation agencies, as well as to a possibly fancied surplus of freight carrier facilities of other types.

Widespread public recognition of the important role of inland water transportation has certainly been a basic principle of European national economy and defense and its general acceptance has resulted in growth of an extensive system of interconnected rivers and canals. The latest tabulation obtainable before the outbreak of hostilities gave approximate mileages of inland waterways of the principal European countries as follows:

	Miles
Germany	9,000
France	7,500
Great Britain	4,000
Russia	56,000
Netherlands	3,000
Belgium	1,000

As these figures include waterways of varying widths, depths, and stages of completion and later information indicates sweeping modifications of the relative standings, the table is not of great present significance. The German program of 1938–39 required the rapid completion of the Rhine-Main-

Danube project providing a continuous inland water route for vessels up to 1,500-tons capacity all the way across Europe from the North Sea to the Black Sea. Determined to keep open this vital life-line, the Nazi Government repeatedly ignored the risk of involvement with Russia in its successive steps to gain complete control of the lower Danube. Recent reports imply that many other projects must have been rushed to completion, possibly with impressed labor, in line with the Nazi Government's plan to unite in one vast network all waterways in conquered territory to form a completely unified inland transportation system. Months before the invasion of Poland, Germany was using her own waterways to decentralize vital industries and move their equipment away from vulnerable frontiers to strategic interior localities. The entire canal system of Central Europe is undoubtedly being used to take over the movement of heavy, bulky, nonperishable freight to relieve the railroads and highways for the quick transport of military and industrial personnel and supplies. Without such an efficiently organized transportation system it would have been impossible to keep the powerful mechanized units of the Nazi armies supplied with ammunition and food during the critical stages of the recent campaigns.

Until the mystery which veils events connected with the invasion and collapse of Holland, Belgium, and France has been cleared, it is impossible to appraise the effectiveness or the degree of justification for the artificial canal systems of those countries. They are obviously now being put to effective use by the German armies of occupation, and they have been selected, reportedly without signal success, as targets of vital military and economic importance by the Royal Air Force of Great Britain.

A well-developed water transportation system would have been a most welcome and valuable adjunct to this country in the last war. While it is true that land transport facilities are now much more extensive, efficient, and elastic than they then were, the tempo and requirements of modern warfare have been stepped up in even more remarkable degree. Transportation in this country during the last war was carried on free from the exigencies, difficulties, and disruptions which it would have to undergo if centers of active operations were actually shifting rapidly about on our own soil and exposed to modern aerial bombing attacks. Such a possibility is no longer an academic hypothesis but must be included in the consideration of current transportation problems.

The great central region between the Appalachian and the Rocky Mountains has aptly been termed the "Citadel of Defense" of the United States. It is the area least vulnerable to attack; it would be the last section to which hostile forces could penetrate. Here where the vital activities of the Nation might have to be concentrated, the present tonnage of the existing waterway system could be tripled or quadrupled with comparatively small outlay and loss of time. A substantial number of freight cars and trucks could thus be released in a short time for more pressing military service in any required zone. (A minor benefit would be that on return to a peacetime basis the investment tied up in equipment which would presumably have to be retired from active service would be less in case of water carriers on a capacity basis than in the case of overland carriers.) The comparative rapidity and economy with which waterway transportation can be expanded in an emergency is thus one of its most important elements of defense value. It hardly needs to be emphasized in this connection, however, that the waterway system upon which the expansion of facilities must take place should be provided as far ahead of the emergency as human judgment can foresee.

Rationale of Inland Water Transport

The Inland Waterway System

The foregoing survey has shown that the natural waterways of the country were the first avenues of commerce and national development; that their improvement for navigation was early recognized and adopted as an appropriate function of the central government; that their free use by the public has been a traditional principle of national policy since the beginning. The records show that some 28,000 miles of inland waterways have been improved to varying extent by the Federal Government and that freight transportation on these waterways for the calendar year 1939 totaled 20 billion ton-miles. Although statistically correct, these figures are not particularly significant because they embrace types of improvement ranging from elaborate canalization projects through every grade of importance to isolated seasonal snagging operations that, while serving or having served the purposes for which they were provided, cannot properly be considered factors in national transportation. Most of the money is spent, most of the tonnage is carried, and most of the competition arises on some 6,000 miles of standard interconnected waterway of dimensions adequate to facilitate the operation of efficient modern towboats and barges in economical fleets between important inland and coastal commercial centers. It is to this effective inland waterway system that the foregoing discussion has been largely confined.

Progressive development.—Progressive standardization of facilities and development of appropriate specialized motive power, hull design, cargo space, loading and unloading machinery have enabled inland water-

way transportation to adapt itself successfully to the particular work it has to perform. Seasonal restrictions on the northernmost channels are offset in large measure by the movement of fuel and raw material during the open season and their subsequent storage against anticipated needs. Operating bases are shifted according to seasonal demand. Intensive study is being given to the problem of overcoming unfavorable load factors. The limited reach of navigable channels is being progressively broadened by combining with other services to extend the collection and distribution of freight throughout the interior of the country. The waterway system is still in the making. When its main stems and branches have been completed and opened to the interchange of traffic in standard equipment long enough for accessorial services to have gravitated to waterside, and when the vexatious uncertainties of the competitive situation have been settled, the full advantages of this means of transportation in promoting progress and security may be expected to become increasingly evident.

The competitive situation.—The inland waterway system did not just grow; it has developed in response to the insistent demand of domestic commerce for means of moving heavy freight in large volume at low cost. An increasing number of the country's industries are being built up with water transportation as a basic factor. The pressure of this demand has grown steadily heavier while the effects of the depression were curtailing the normal business of competing types of carrier, thus bringing to an acute stage the problem of maintaining or scrapping the weakest and least economical of the surplus transportation agencies. The situation has been aggravated rather than cured by the establishment of depressed rates on competitive business which has depleted the revenues of the high cost and low cost carriers alike, created an artificial distribution of traffic, and thus further complicated the problem of adjusting the transportation machine.

Valuation of benefits.—Scarcity of reliable cost data and failure properly to interpret statistics and clearly to recognize the full implications of prevailing competitive practices continue to retard the sound appraisal of inland waterways in many quarters. It will generally be found illogical and misleading to compute unit costs of navigation improvements in terms of ton-mileage artificially depleted by competitive tactics that are clearly uneconomic. It is equally unsound to saddle existing water-borne tonnage with the cost of obsolete and superseded navigation works no longer used or useful. The cost of uncompleted structures which cannot yet have aided present navigation has no place among the annual charges set up to test present waterway traffic. Assuming that each project has been thoroughly investigated and properly designed, the only sound basis found for measuring the value of waterways is the effective cost of the currently useful navigation facilities in terms of their capacity for efficient economical service to traffic disclosed by survey to be available. It will be generally conceded that the development of more efficient and economical transportation routes must not be obstructed to save existing agencies from loss of business, else progress would be harmfully retarded. In determining whether one means of transportation is actually more efficient or economical than another, clearly all the direct costs which are incurred in making each available must be taken into consideration. In the case of waterways the essential question is whether, assuming no reduction in normal rates of competitors, they make available alternate means of transportation which furnish the service more efficiently or economically, considering all elements of cost, than the next most favorable means. That sound basis of comparison cannot be discarded in favor of a manifestly unsound basis merely because the sound one is difficult of determination and the unsound one easy. The material already presented as to the economic showing of major projects completed and nearing completion is believed to constitute adequate proof that the inland waterway system is satisfactorily meeting the test and fulfilling the needs of national industry and agriculture.

Expenditure of Federal funds for navigation improvements.—It is not within the province of this chapter to debate the abstract principle of public aid. Suffice it to say that there is nothing new or radical in the policy, nor do the keenest competitors of inland water transportation challenge its application to deep-draft river, lake, and coastwise channels which serve to connect and extend overland carrier services. Congress evidently finds ample justification and precedent for the assumption by the taxpayer of all or part of the cost of these and many similar activities. Savings in transportation costs by waterway do not stop with the shipper but are distributed through the user of the facilities to the consuming public. As Dr. D. Philip Locklin repeatedly emphasizes in his "Economics of Transportation," the short-time results may be quite different but the long-time effects invariably work out as described. However, the principle adds perplexing inequalities to the already complicated matter of traffic distribution for which the gradual abandonment of the "added traffic" theory of fixing rates seems to offer the only promising solution. Once the traffic found potentially adapted to waterways has been permitted free development, overland agencies cannot successfully compete for it on a cost basis, no matter what statistical gymnastics are resorted to.

Regulation and the future of waterways.—With regulation of inland waterway transportation placed under the same Federal agency that regulates railway and highway transportation, a gradual and orderly discontinuance of present-day uneconomic and destructive practices is expected. Barge-adapted tonnage now moving overland at noncompensatory rates is of no profit to high-cost land carriers and the effects of its final diversion to waterways would not prove disastrous. It would be indefensible to shackle water carriers with purely artificial and unnecessary expense burdens merely to place the weaker and less efficient carriers in a more favorable competitive position. If there is, indeed, a surplus of transportation, it is to be found among the weak and inadequate overlapping and duplicating services that have outlived their usefulness or were unsoundly conceived and designed in the first place. In the normal course of adjustment it will logically be these weak, costly, wastefully uneconomic lines that are selected for abandonment, be they railroads, highways, or waterways, and those remaining will be far healthier as a result of such economic surgery.

A substantial volume of barge-adapted freight will always be found traveling by rail or truck in spite of rate differentials on account of superior service and accessibility. With the rates of each type of carrier fixed at its own compensatory level, both barge lines and overland carriers will profit by the freight which seeks their services, and the shipping public will have, and is entitled to, the choice of the agency which best suits its particular needs. With continued managerial foresight, a cooperative attitude on the part of competitors and constructive Federal direction and control, inland waterway carriers, by performing the service for which they are best fitted, are expected to add materially to the efficiency of industry in the critical months and years ahead. Other types of carrier will reap a full share of the benefits. Regulation that preserves for the public the inherent advantages of each form of transportation will promote the physical employment of waterways to their maximum potential capacity for useful service. It is on that basis, with a view to Nation-wide prosperity and security, that the maintenance and expansion of inland waterway facilities are being planned and carried out.

PART II—SECTION V
PETROLEUM PIPE-LINE TRANSPORTATION

By G. Lloyd Wilson [1]

Petroleum Production in the United States

The significance of pipe-line transportation of petroleum to the oil industry and to other instrumentalities of transportation and the peculiar importance of this industry in the United States cannot be fully explained without first describing the nature, amount, and location of petroleum production and the refining and distribution of crude oil and its products.

The average annual crude petroleum production in the United States for the six decades preceding 1940 is shown in table 1.

In 1940 production reached an all-time high of 1,351,847,000 barrels. Petroleum is produced in commercially important quantities in 21 States, three of which account for 68.7 percent of the total. See table 2.

There were approximately 372,469 producing oil wells in the United States in 1939. The distribution of these wells by States and the average daily production per well in 1938–39 is shown in table 3.

Crude petroleum is first led from the producing wells to field storage. From there a system of gathering lines transports it by the main trunk lines, by rail, or by pipe line and tanker, to refineries or to tidewater for export. Approximately 1,204 million barrels of domestic petroleum and 33.5 million barrels of foreign oil were run to stills from wells or storage tanks in 1939.

At the refineries the crude petroleum is subjected to one of the 14 different types of refining processes. There are eight districts having an aggregate daily refining capacity of 100,000 barrels or more and 52 other centers whose capacity is between 10,000 and 100,000 barrels daily. Areas in which there are refineries having an aggregate capacity of 100,000 barrels or more per days are:

1. Baton Rouge, La., district.
2. Chicago, Ill., port district.
3. Houston, Tex., port district.
4. Los Angeles, Calif., basin district.
5. New York, Newark Bay, N. J., district.
6. Philadelphia, Pa., port district.
7. Port Arthur - Beaumont - Texas City, Tex., district.
8. San Francisco, Calif., bay district.

Areas having refineries with an aggregate daily capacity ranging between 10,000 and 100,000 barrels are:

9. Arkansas City, Kans.
10. Ashland, Ohio, to Catlettsburg, Ky.
11. Augusta, Kans.
12. Bakersfield, Leber, Calif.
13. Baltimore, Md.
14. Big Springs-Colorado, Tex.
15. Billings-Laurel, Mont.
16. Blackwell, Okla.
17. Borger, Tex.

TABLE 1.—*Average Annual Production of Petroleum, by Decades, 1880 to 1939*

Decade:	Average annual production (thousands of barrels)
1880–89	27, 295
1890–99	53, 517
1900–09	122, 832
1910–19	281, 863
1920–29	726, 353
1930–39	1, 020, 153

Source: U. S. Bureau of Mines, *Minerals Year-Book*, various years.

TABLE 2.—*Percent Distribution of Petroleum Production, by States, 1939*

State:	Percent
Texas	38. 2
California	17. 7
Oklahoma	12. 7
Illinois	7. 5
Louisiana	7. 4
Kansas	4. 8
New Mexico	3. 0
Others	8. 7

Source: U. S. Bureau of Mines, *Minerals Year-Book*, 1940.

TABLE 3.—*Crude Oil Production by States, 1939*

State	Number of active wells, 1939	Average daily production (barrels per well), 1939
United States total	372, 469	9. 24
Arkansas	3, 020	19. 38
California	14, 188	43. 32
Colorado	201	19. 10
Illinois	16, 614	15. 15
Indiana	1, 379	2. 85
Kansas	23, 707	6. 84
Kentucky	14, 320	1. 08
Louisiana	5, 324	49. 32
Michigan	2, 758	23. 50
Montana	1, 923	10. 81
New Mexico	2, 990	34. 52
New York	14, 250	. 98
Ohio	29, 710	. 29
Oklahoma	55, 654	7. 55
Pennsylvania	78, 725	. 60
Texas	90, 736	14. 65
West Virginia	13, 200	. 73
Wyoming	3, 770	15. 46

Source: *Oil and Gas Journal*, January 25, 1940, Petroleum Publishing Co., Tulsa, Okla.

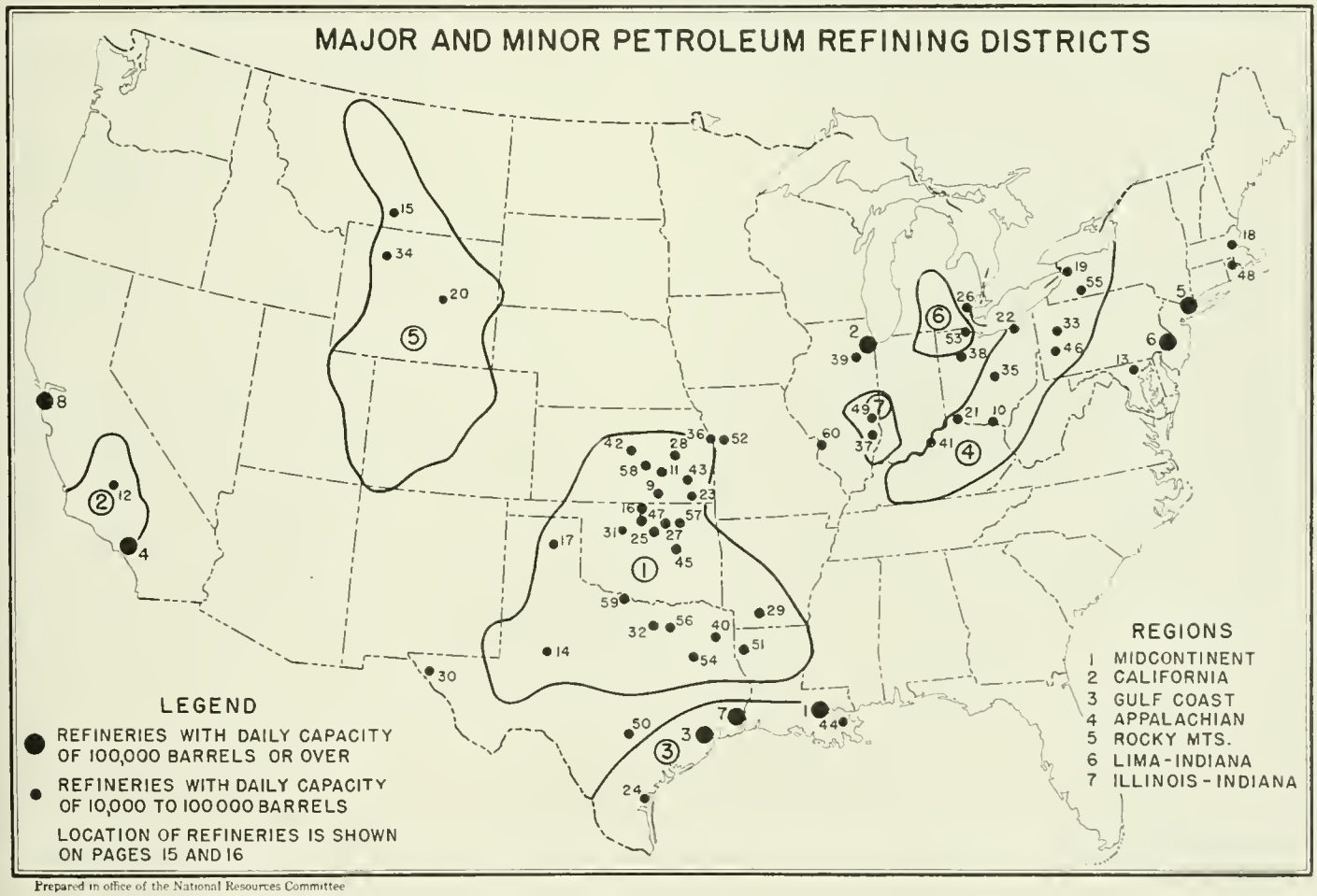
[1] Consultant, National Resources Planning Board. The author has been assisted in preparation of the material for this report by Doris L. Whitnack.

18. Boston, Mass., district, East Braintree and Everett.
19. Buffalo - Tonawanda, N. Y.
20. Casper, Wyo.
21. Cincinnati - Hoover, Ohio, and Latonia, Ky.
22. Cleveland, Ohio.
23. Coffeyville, Kans.
24. Corpus Christi-Ingleside, Tex.
25. Cushing, Okla.
26. Detroit - Trenton, Mich.
27. Drumright, Okla.
28. Eldorado, Kans.
29. Eldorado - Union County, Ark.
30. El Paso, Tex.
31. Enid, Okla.
32. Fort Worth, Tex.
33. Franklin - Rouseville, Oil City, Pa.
34. Graybull, Big Horn County, Wyo.
35. Heath, Ohio.
36. Kansas City, Mo. Kansas City-Argentine, Kans.
37. Lawrenceville, Ill.
38. Lima, Ohio.
39. Lockport, Ill.
40. Longview - Gladewater, Tex.
41. Louisville, Ky.
42. McPherson, Kans.
43. Neodesha, Kans.
44. New Orleans, La.
45. Okmulgee, Okla.
46. Pittsburgh, Pa.
47. Ponca City, Okla.
48. Providence, R. I.
49. Robinson, Ill.
50. San Antonio, Tex.
51. Shreveport, La.
52. Sugar Creek, Mo.
53. Toledo, Ohio.
54. Tyler-Henderson, Tex.
55. Wellsville, N. Y.
56. West Dallas, Tex.
57. West Tulsa, Okla.
58. Wichita, Kans.
59. Wichita Falls, Tex.
60. Wood River, Ill.

The approximate location of the major and minor refining centers listed above is shown in figure 42.

Distribution of Petroleum

Four types of carriers compete for crude petroleum traffic—pipe lines, tankers and barges, railroads, and motor trucks. Routes embracing several of these types of transportation are not uncommon. During the hearings before the Temporary National Economic Committee, it was stated that in each year between 1934 and 1937, about 71 percent of the crude oil received at refineries was delivered by pipe line, 26 percent by tanker or barge, and 3 percent by tank cars and



Prepared in office of the National Resources Committee

FIGURE 42

trucks.[2] A very heavy movement of both crude oil and gasoline by tanker from Gulf of Mexico ports to Atlantic Coast refineries was reported. This oil is originated in producing fields in Texas, Oklahoma, and Louisiana. The volume of crude petroleum originated by pipe lines, railroads, and water carriers during 1926, 1931, 1935, and 1939 is shown in table 4.

TABLE 4.—*Crude Petroleum Originated by Pipe Line, Railroad, and Water Carrier, 1926, 1931, 1935, and 1939*

[Thousands of barrels]

Year	Pipe lines [a]	Railroads [b]	Water carriers [c]
1926	397,320	69,110	304,196
1931	489,135	47,929	218,468
1935	722,995	22,490	244,961
1939	802,828	38,153	302,735

Source: [a] *Statistics of Oil Pipe Lines*, various years, Interstate Commerce Commission.
[b] *Freight Commodity Statistics, Class I Steam Railways in the United States*, Interstate Commerce Commission, for various years ending December 31.
[c] *Annual Report of the Chief of Engineers, U. S. Army*, part 2, various years.

A large portion of the crude oil moving in interstate commerce is transported by pipe line. The number of barrels transported rose steadily until 1931, suffered a decline in 1931–32, but recovered in 1933 and reached its all-time peak in 1934. Since then, the volume has fluctuated; and in 1939 amounted to 212 percent of that for 1920; but was only 94 percent of the peak year. The crude oil traffic of pipe lines reporting to the Interstate Commerce Commission is shown in table 5 for the years 1931, 1935, and 1939.

TABLE 5.—*Crude Oil Traffic of Pipe Lines Reporting to the Interstate Commerce Commission, 1931 to 1939*

Year	Barrels originated	Received from connecting lines	Total transported	Ratio of oil originated to oil transported	Average haul
	Thousands	*Thousands of barrels*	*Thousands of barrels*	*Percent*	*Miles*
1931	489,135	([a])	1,127,796	43	
1935	722,995	281,970	1,004,965	72	295.7
1939	802,828	330,139	1,132,967	71	330.3

[a] Not available.
Source: *Statistics of Oil Pipe Lines*, various years, Interstate Commerce Commission and Federal Coordinator of Transportation, Section of Transportation Service.

TABLE 6.—*Movement of Domestic Refined Petroleum Products Originated by Pipe Line, Railroad, and Water Carrier, 1926, 1931, 1935, 1939*

[Thousands of barrels]

Year	Pipe line [a]	Railroad [b]	Water carrier [c]
1926		353,086	450,697
1931	15,658	401,260	439,322
1935	43,593	255,727	566,965
1939	70,152	355,717	722,829

Source: [a] *Statistics of Oil Pipe Lines*, Interstate Commerce Commission.
[b] *Freight Commodity Statistics*, Interstate Commerce Commission, various years.
[c] *Annual Report of the Chief of Engineers, U. S. Army*, part 2, various years.

Complete data regarding the movement of refined petroleum products by various types of carriers are not compiled by any one agency, nor can the fragmentary data from different sources be pieced together to form a composite picture. In some tabulations refined petroleum traffic is combined with crude petroleum traffic. The combined water, rail, and pipe-line movement of refined petroleum products is presented in table 6; motor-carrier shipments are not available.

Pipe lines are the only carriers which have enjoyed a steady increase in volume of refined petroleum transported. In 1926, they had a very insignificant amount of traffic, but by 1939, they were originating 70,152,309 barrels or 6 percent of the total amount carried by water, rail, and pipe. Table 7 shows the refined oil traffic of pipe lines reporting to the Interstate Commerce Commission, 1935 to 1939.

TABLE 7.—*Refined Oil Traffic by Pipe Lines Reporting to the Interstate Commerce Commission, 1935 to 1939*

Year	Barrels transported	Number of barrels originated on line	Number of barrels received from connecting lines	Barrel-miles transported	Average haul
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Miles*
1935	53,875	43,593	10,282	[a]17,196,273	395
1936	62,489	51,547	10,941	[b]18,441,905	358
1937	80,509	62,978	17,530	22,346,832	355
1938	88,568	65,117	23,451	23,687,157	364
1939	95,060	70,152	24,908	24,429,632	348

[a] Data not available for 3 companies.
[b] Data not available for 1 company.
Source: Interstate Commerce Commission, *Statistics of Oil Pipe Line Companies*, 1939.

Growth of Petroleum Pipe Lines

The pipe-line system in 1939 consisted of approximately 61,000 miles of crude oil trunk lines, 6,750 miles of gasoline lines, and 55,000 miles of gathering lines.[3] The crude oil trunk lines transport petroleum from all gathering tank farms to the refineries or ports; gasoline trunk lines extend from refineries or ports to distributing points; and gathering lines bring petroleum from the wells to tank farms, concentrating and storage points, trunk pipe lines, or to railroad loading racks.

The location of gathering lines is determined by the location of oil wells, but the trunk lines are dependent also upon the location of refineries and markets. Trunk pipe lines frequently transport crude petroleum to tidewater or railroad terminals but the majority terminate at refineries. Some refineries, including those in New England, are not connected with trunk pipe lines, but the majority of the large plants have at least one such

[2] "Investigation of the Concentration of Economic Power," *Petroleum Industry*, part 14-a, 76th Cong., 2d sess., Sept. 25, 1939, p. 7719.

[3] Estimate of American Petroleum Institute.

connection. The mileage of all pipe lines as estimated by the American Petroleum Institute for selected years 1926 to 1939 is shown in table 8.

TABLE 8.—*Petroleum Pipe-line Mileage, for Selected Years, 1926–1939*

Year	Crude oil trunk lines	Crude oil gathering lines	Gasoline pipe lines	Total mileage
1926	44,470	45,700		90,170
1931	58,020	53,640	3,274	114,934
1936	57,820	52,760	4,458	115,760
1939	61,000	55,000	6,750	122,750

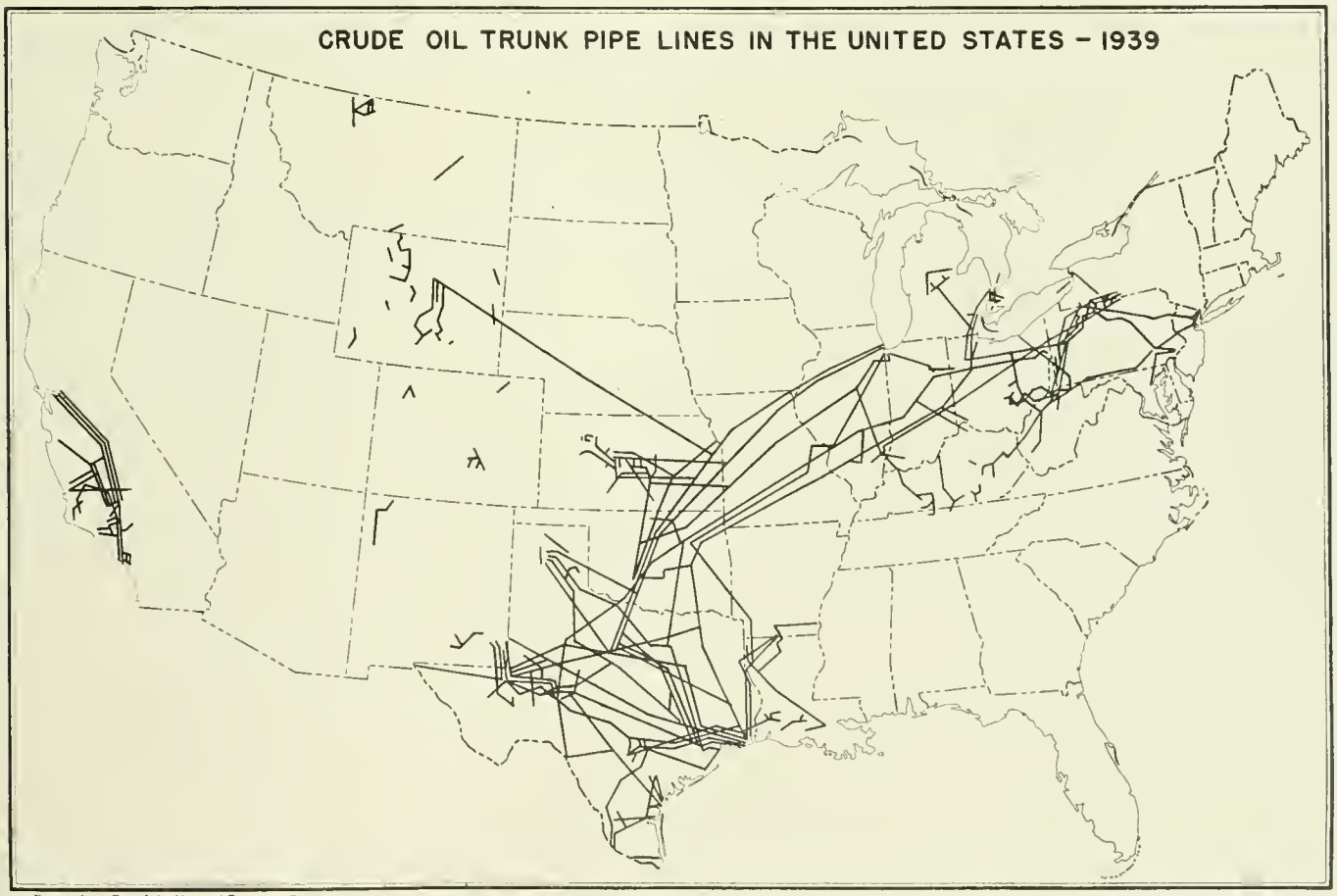
Source: American Petroleum Institute, *Petroleum Facts and Figures*, 7th ed., 1941.

The growth of the network of pipe lines has been very rapid since 1920. Prior to this time the principal movement of crude petroleum from the midcontinent district to the Atlantic seaboard was by pipe lines. After 1920, as a result of the development of transportation by water from California and from Gulf of Mexico ports to eastern refineries, the direct pipe-line movement of crude from the midcontinent field to the Atlantic seaboard declined to a comparatively small figure. A number of pipe lines in the east were abandoned or adapted to transport petroleum from the east coast westward, several were converted into natural-gas pipe lines and one was made over to carry refined products. Although pipe-line movement from the midcontinent district to the seaboard diminished, expansion of refining facilities in the Central States necessitated the construction of several new pipe lines and the looping of most of the others in order to increase their carrying capacity.

Routes of the principal crude and refined petroleum pipe lines in the United States are reproduced in figures 43 and 44. A sketch map of a typical gathering-line system is shown in figure 45.

At the close of 1939 there were 63 pipe-line carriers reporting to the Interstate Commerce Commission. These companies operated 53,641 miles or 87 percent of all crude oil trunk lines, 39,573 miles or 74 percent of all crude oil gathering lines, and 5,467 miles or 75 percent of all trunk lines for transporting refined petroleum products.

Gathering lines are often laid with the idea that



Prepared in office of the National Resources Committee

FIGURE 43

they are to be moved as soon as the flush output of the field declines; trunk pipe lines, on the other hand, are more permanent installations. Because of their less permanent nature, gathering lines are frequently placed on the surface of the ground and are rarely treated with a preservative coating. In some cases, gathering lines have been taken up and relaid in new locations several times within a 5-year period, hence the increase of 7,940 miles in the total mileage of gathering lines between 1926 and 1931 shown in table 8 does not reflect accurately the mileage of gathering lines actually laid during that period.

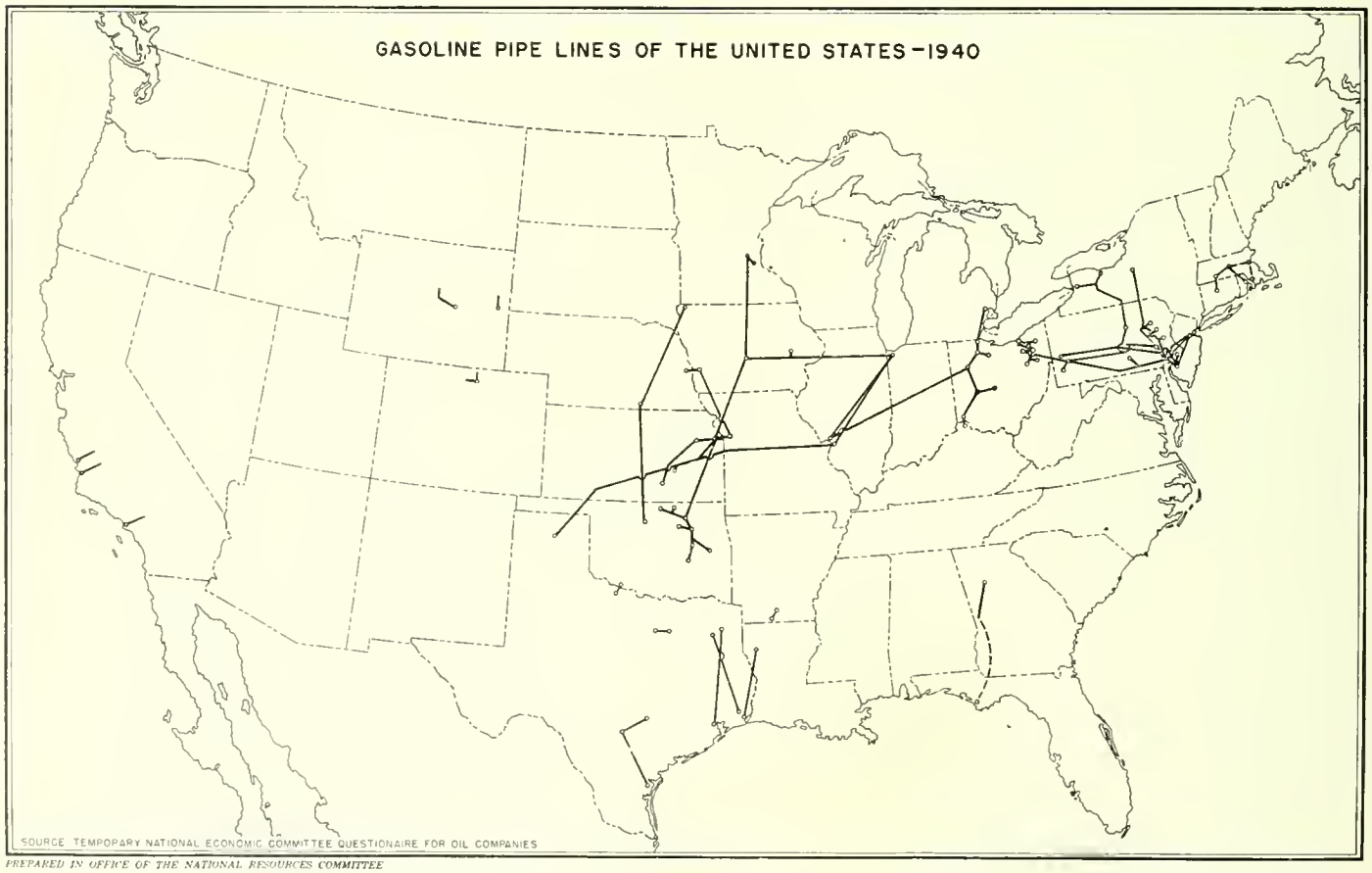
The different pipe lines vary greatly in physical characteristics, particularly with respect to the size of pipe. In table 9 the 1936 mileage of crude oil lines is classified by pipe sizes. On trunk lines sizes between 6 and 12 inches seem to predominate. Small pipe (under 6 inches) and large pipe (over 12 inches) are generally used only to meet special operating conditions. The most common size of pipe used in gathering lines is 2 inches in diameter. There were, however, 10,370 miles of large-diameter gathering lines, approximately 20 percent of the total gathering system mileage. A considerable portion of this large-sized pipe is in service in California and in west Texas where the wells have a high average yield.

Great progress has been made during recent years in petroleum pipe-line construction, chiefly by the use of larger diameter and stronger pipe, by the substitution of the welded joint for the screw joint, and by use of better methods for preventing corrosion. The use of larger pipe line in trunk-line construction has

TABLE 9.—*Crude Oil Pipe-Line Mileage, by Sizes, June 30, 1936*

Size, inside diameter	Miles of trunk pipe line	Miles of gathering line	Total mileage of trunk and gathering line
All sizes	57,820	52,760	110,580
2 inches		19,620	19,620
3 inches		9,220	9,220
Under 4 inches	1,270		1,270
4 inches	3,990	13,550	17,540
6 inches	10,460	7,680	18,140
More than 6 inches		2,690	2,690
8 inches	27,060		27,060
10 inches	9,450		9,450
12 inches	5,510		5,510
More than 12 inches	80		80

Source: Compiled from *Survey of Crude Oil in Storage, 1936–37*, U. S. Bureau of Mines, September 1938.



PREPARED IN OFFICE OF THE NATIONAL RESOURCES COMMITTEE

FIGURE 44

been motivated by a desire to reduce operating costs even when it is necessary to increase the initial investment in order to do so. Laying of stronger pipe, particularly seamless, has resulted from the desire to increase delivery capacity without enlarging the diameter of the pipe—in other words to permit increases in operating pressure. In addition to improvements in the pipe itself, there has been steady technological advance in the methods of laying pipe. The most important development of this kind is the use of welding for connecting the joints. Screw lines have also been reconditioned by welding the couplings. The corrosion problem is serious and the chief method employed in preventing it is to coat the pipe. The mileage of oil trunk line protected by a coating of 1/16 inch or greater, amounted to 41 percent of the total. The cathodic protective treatment has emerged from the experimental state and is now being widely used. Another change in pipe-line construction and operation has been the reconditioning of old equipment and the installation of additional new pumping facilities in order to increase the carrying capacity of the lines. As a result the carrying capacities of a number of older pipe lines have been increased 40 percent or more. There has also been a tendency to reduce the time the pipe lines are shut down due to failure of pumping equipment, breaks in the lines, or other causes. Improved design of the lines, better training of personnel, and improved equipment, have made this possible.

Pipe-Line Storage Capacity

There are several types of storage facilities for petroleum. Working storage facilities are those required for the efficient operation of the lines. Other facilities are required at the points of origin for storage of petroleum awaiting movement or sale, or at destination while it awaits refining or further movement. These facilities are located in the oil fields; at the junction points between gathering lines and trunk lines or between two or more trunk lines; at ports where the oil is transshipped from trunk lines to steamships; at points where the oil is transferred from pipe lines to railroads; and at the refining centers. Crude petroleum storage facilities as of June 30, 1936, con-

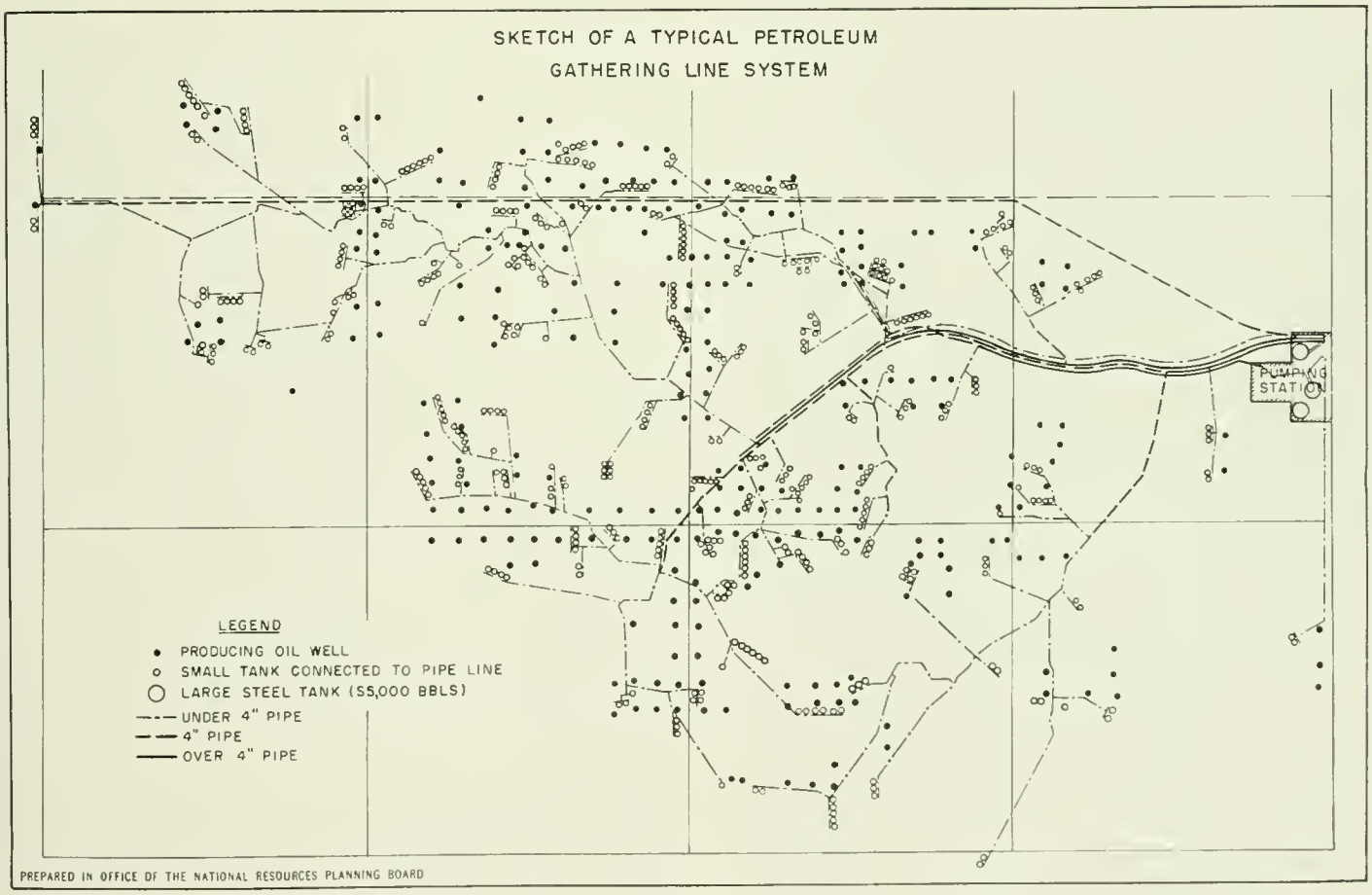


FIGURE 45

sisted of 15,094 tanks with a capacity of approximately 583 million barrels distributed as follows: 3,390 tanks with a capacity of 56 million barrels at pipe-line stations; 8,621 storage tanks with a capacity of 423 million barrels at tank farms; and 3,083 tanks with a capacity of 104 million barrels at refineries. Net stocks at that time included 278,997,000 barrels in tanks and 21,553,000 barrels of pipe-line fill.

Pipe Lines as Common Carriers

Prior to 1906 regulation of petroleum pipe lines was left entirely to individual States. The first Federal statute upon the subject was the Hepburn Act of 1906 which amended section 1 of the Act to Regulate Commerce. This legislation provided that the act should apply to any corporation, person, or persons engaged in the transportation of oil or any commodity (except water and natural or artificial gas) "by means of pipe line or partly by pipe line and partly by railroad, or partly by pipe line and partly by water * * * from one State, territory, or district of the United States or to any foreign country."

The status of petroleum pipe lines under the Interstate Commerce Act first came before the Interstate Commerce Commission in 1912 in *In the Matter of Pipe Lines.*[4] In this proceeding several petroleum pipe-line companies contended that their lines were built over privately acquired rights-of-way and that the oil transported was the property of the proprietary companies. For these reasons the companies contended that they were not common carriers and, therefore, not subject to the Act. It developed that most of these pipe-line companies required the independent petroleum producers to sell the oil to the pipe-line companies prior to its transportation. The Commission construed the Hepburn Act to place under its jurisdiction any pipe-line companies transporting petroleum in interstate commerce whether or not they had held themselves to be common carriers of petroleum in interstate commerce prior to the passage of the Hepburn Act. The Commission also found that the transfer of a portion of the property of what was actually a common-carrier pipe line to a private corporation without any corresponding change in the actual activities of the pipe line did not render the pipe line immune from the provisions of the Act nor relieve it from its obligations as a common carrier. Accordingly, the Commission ordered all of the interstate pipe-line companies to file tariffs of rates and charges in compliance with the provisions of section 6 of the Interstate Commerce Act.

The lawfulness of this requirement was upheld by the United States Supreme Court as a result of proceedings instituted by the pipe-line companies to set aside the order of the Commission.[5] In the *Uncle Sam Oil Co.* case, the Supreme Court found that a petroleum pipe line used for the sole purpose of transporting petroleum of an oil company from its own wells in one State to its own refinery in another State was not engaged in the transportation of petroleum in interstate commerce as a common carrier, but in the operation of a plant facility.

The Transportation Act of 1920 further amended the Interstate Commerce Act in section 1 (3) to provide that the term "common carrier" as used in the Interstate Commerce Act should include all pipe-line companies engaged in interstate commerce. The act as it now stands stipulates "that the provisions of the act shall apply to common carriers engaged in * * * the transportation of oil or other commodities, except water and except natural or artificial gas, by pipe line, or partly by pipe line and partly by railroad or by water."[6]

The question of the constitutionality of state statutes fixing the common-carrier status of petroleum pipe lines came before the Federal courts on several occasions.[7] In a leading case, *Producers' Transportation Company* v. *Railroad Commission of California*, the United States Supreme Court upheld the constitutionality of the California statute which provides that every private corporation or individual operating "any pipe line or any part of any pipe line * * * for the transportation of crude oil * * *, directly or indirectly, to or for the public, for hire * * * and which said pipe line * * * is constructed or maintained upon, along, over, or under any public highway, and in favor of whom the right of eminent domain exists," shall be considered to be a common carrier, and subject as such, to the jurisdiction of the California Railroad Commission. The Court held also that a common carrier may not prevent or postpone the exercise of the power of a State to regulate the carrier's rates or practices by making contracts for future transportation.[8] The Court stated, however, "It is, of course, true that if the pipe line was constructed solely to carry oil for their producers under strictly private contracts and never was devoted by its owner to public use, that is, to carry for the public, the State could not by mere legislative fiat or by regulation or other permission

[4] 24 I. C. C. (1912).

[5] *The Pipe Line Cases*, 234 U. S. 548 (1914).

[6] Interstate Commerce Act, section 1(1)(b).

[7] See *Hall* v. *Cumberland Pipe Line Co.*, 193 Ky. 728 (1922); *Standard Oil Co. of Louisiana* v. *Public Service Commission*, 154 La. 557 (1923); and *Producers' Transportation Co.* v. *Railroad Commission of California*, et al., 251 U. S. 228 (1920).

[8] *Producers' Transportation Company* v. *Railroad Commission of California*, et al., 251 U. S. 228 (1920).

convert it into a public utility or make its owner a common carrier." [9]

In an important decision in 1922,[10] the United States Supreme Court held that where a foreign corporation constructed a pipe line in Oklahoma it could not complain of an Oklahoma statute requiring all corporations transporting crude petroleum through pipe lines to be deemed common carriers at common law.

In a decision of the Supreme Court of Oklahoma,[11] the court held that a pipe-line company engaged in the transportation of crude oil for hire, although a private contract carrier prior to the passage of a State law declaring such companies to be common carriers, became a common carrier upon the passage of the State law declaring it to be such.

In 1941 the Southeastern Pipe Line Company constructed a pipe line for the transportation of refined products from Port St. Joe, Fla., to Bainbridge, Ga., and the line is projected to extend to Atlanta, Ga., and Chattanooga, Tenn. At several places it must pass under or across several railroad rights-of-way. The pipe-line company or its construction company applied to each railroad for permission to cross the rights-of-way of the respective carriers. It also sought to acquire other private property by condemnation. The permission in all instances was refused. The pipe-line company claimed the power of eminent domain which was denied by the Supreme Court of the State of Georgia. In *Botts* v. *Southeastern Pipe Line Co.*, the Supreme Court of Georgia held that the power of eminent domain had not been conferred upon pine lines by the Code of Georgia [12] nor by the Act of March 27, 1937,[13] but that these laws relate only to the method of exercising the power where it otherwise exists. In January 1940, after permission to cross the right-of-way of the Georgia, Florida & Alabama Ry. had been denied, the contractor employed by the Southeastern Pipe Line Company entered upon and drove the pipe lines under the railway right-of-way in Bainbridge, Ga. Contempt proceedings were instituted in the District Court of the United States for the Southern District of Florida against the pipe-line company for violation of the injunction. The District Court adjudged the pipe-line company guilty of contempt of court. Appeal was taken by the pipe-line company in the United States Circuit Court of Appeals, Fifth Circuit,[14] and the Circuit Court affirmed the judgment.

[9] 251 U. S. 228, 230 (1920).

[10] *Pierce Oil Corporation* v. *Phoenix Refining Co.*, 259 U. S. 125 (1922).

[11] In re *Champlin Refining Co.* 129 Okla., 166 (1927).

[12] Code of Georgia of 1933, sections 36 202.

[13] Georgia Legislature, 1937, 432.

[14] No. 9409, *Southeastern Pipe Line Co. et al.* v. *Powell and Anderson Receivers, A. C. L. R. R. Co.*, 113 F. 2d 434 (1940).

In September 1941, the pipe-line company was given the power of eminent domain under authority of the Cole Pipe Line Act of that year.

In June, 1934, the Interstate Commerce Commission by its own motion entered upon an investigation of the lawfulness of charges for the interstate transportation of crude petroleum by pipe line. Thirty-seven interstate pipe-line carriers were made respondents. On April 3, 1936, a proposed report was issued, recommending that the Interstate Commerce Commission should find unreasonable any minimum tender requirements in excess of 10,000 barrels of crude oil for a single shipment. In a later proposed report it was suggested that the rates, rules, regulations, and practices of the respondent pipe-line companies applicable to the transportation of crude petroleum by pipe line be found not unlawful and that the proceedings be discontinued. In the Commission's decision and order handed down December 23, 1940, the rates, charges and regulations as to minimum tenders of certain of the respondent carriers were found to be excessive and unreasonable and the respondents were required to show cause why an order prescribing reductions in rates and minimum-tender requirements should not be entered.[15]

The Federal District Court for the Western District of Pennsylvania has held that the fact that interstate transportation carried on by a pipe-line company involved only oil which the pipe-line company itself owned does not operate to exclude the pipe line from provisions of the Interstate Commerce Act as amended by the Hepburn Act since that Act was not restricted to pipe-line companies which were common carriers in the technical sense but included all pipe-line companies engaged in interstate transportation of oil except those carrying oil from their own wells to their own refineries for their own use.[16]

On September 30, 1940, the United States instituted proceedings against the American Petroleum Institute, the principal refining companies, and petroleum pipe lines engaged in interstate commerce alleging violation of the Sherman Anti-Trust Act through alleged restriction of production of crude petroleum and products, fixing of prices, and controlling pipe-line transportation of crude oil and refined products.[17]

Pipe-Line Patronage

Unlike other forms of transportation, petroleum trunk lines serve very few shippers. Most of the oil

[15] *Reduced Pipe Line Rates and Gathering Charges*, 243 I. C. C. 115 (1940).

[16] *Valvoline Oil Co.* v. *U. S.* 24 Fed. Supp. 355 (1939).

[17] *U. S. v. American Petroleum Institute*, Civil Action No. 8524, District Court of the United States for the District of Columbia, complaint filed September 30, 1940.

is carried for companies affiliated directly or indirectly with the pipe-line companies. A much larger proportion of the traffic of gathering lines, however, is transported for independent producers. The use of pipe lines by petroleum producers not having a community of interest with the pipe-line companies was surveyed in 1933 by Dr. W. M. W. Splawn.[18] Table 10 shows the relationship of oil transported for those having no interest in the pipe-line companies to the total oil transported in trunk and gathering-line service for the year 1931. Answers to T. N. E. C. questionnaires indicate that there are several arrangements under which oil is carried for the account of companies other than the one owning the pipe lines. Under one arrangement, the oil transported by the pipe-line company is owned by and is delivered to the refining company for its own use. In a second case, the oil may be owned by the pipe-line company or its subsidiaries while in the process of transportation, but is sold at the terminals. Third, the petroleum may be received from connecting lines affiliated with the refiner who owns the petroleum. Fourth, oil is sometimes transported by connecting lines under joint rate and through rate arrangements. Fifth, oil may be transported under exchange agreement with other petroleum companies whereby a company takes certain oil at one point and delivers like quantities elsewhere as an accommodation, thereby avoiding unnecessary duplication of pipe lines. Probably more than 90 percent of the crude oil transported through the pipe lines is owned by the transporting company. In cases where oil is transported for other companies, the service is apt to be irregular, of short duration, and confined to a relatively small number of other companies.

TABLE 10.—*Ratio of Petroleum or Gasoline Transported for Customers Having no Interest in the Pipe Lines, to the Total Quantity of Petroleum Transported in 1931*

Percentage of outside petroleum or gasoline transported	Number of cases	
	Number of trunk lines	Number of gathering lines
Group 1 pipe lines: [a]		
None	31	37
Less than 1 percent	1	4
1 to 5 percent	4	6
5.1 to 10 percent	3	1
10.1 to 25 percent	9	2
25.1 to 50 percent	4	0
Over 50 percent	6	3
No data	2	6
Group 2 pipe lines: [a]		
None	2	8
1 to 5 percent	0	1
10.1 to 25 percent	0	1
25.1 to 50 percent	1	0
Over 50 percent	1	1
No data	1	3
Group 3 pipe lines: [a]		
None	0	1
25.1 to 50 percent	1	0
Over 50 percent	8	8

[a] Group 1 companies are subsidiaries of large or medium size integrated units of the petroleum industry; group 2 companies are subsidiaries of partially integrated or smaller integrated units; and group 3 are the independent lines.

Source: *Report on Pipe Lines*, H. R. No. 2192, part I, 72d Congress, 2d Sess., 1933.

The only pipe line of which the present writer knows that was built solely for carrier purposes by interests other than those connected with the production or refining of oil, was unsuccessful in attracting traffic and was abandoned.[19]

Minimum Tender Requirements

Petroleum gathering lines generally do not require those who use their facilities to offer any fixed minimum quantity of oil for transportation. On the other hand, the crude petroleum trunk lines and the refined oil or gasoline pipe lines customarily set a minimum quantity that may be tendered as a single run. Minimum tender requirements of petroleum pipe lines are analogous to, but much larger than, carload or truckload minima because operating efficiency is greatly enhanced by the shipment of relatively large quantities of oil in single lots.

Trunk-line minimum tender requirements have contributed materially to the concentration of oil and pipe-line operation in a relatively few companies as well as to the widespread integration of the pipe line, producing, and refining phases of the petroleum industry.[20] Minimum tender requirements of interstate crude-oil pipe lines reporting to the Interstate Commerce Commission in 1940 ranged from 1,000 to 100,000 barrels, 10,000 and 100,000 barrels being the most common minima. Refined-oil minimum tenders generally range from 25,000 to 100,000 barrels. Many of these provide for split delivery. Companies may have different requirements for different portions of line or for local as compared with joint movements or no minimum at all. In order to aid small shippers, the regular minimum tender requirements of some pipe-line companies are modified so that smaller lots will be received from individual consignors to be sent to one consignee and destination, with the provision that the individual consignments will be held until the same kind and quality of oil is received from other shippers for transportation to the same destination.

An ideal minimum tender would be small enough to enable the average shipper to use the pipe lines and at the same time, provide a quantity of oil sufficient to permit shipments under practicable working conditions through pipe lines of different sizes and capacities. In 1922, the Interstate Commerce Commission

[18] The special counsel of the Committee on Interstate and Foreign Commerce of the House of Representatives.

[19] This company, the Crusader Pipe-Line Company of Arkansas, was organized in 1925. It never transported any oil.

[20] See *Report on Pipe Lines, op. cit.*, p. LXVI.

held that a rule requiring shipments to be tendered in lots of not less than 100,000 barrels was unreasonable to the extent that it required tenders in excess of 10,000 barrels.[21] Recently, a similar recommendation was made in the first proposed report of the examiner in I. C. C. Docket No. 26,570, based upon the record in this case which clearly indicated that there was no uniformity in the respondents' minimum tender requirements. Because of variations in the sizes of the pipe lines, in the sizes of the batches of oil required to operate lines of different sizes efficiently and to prevent mixing of the different grades of oil, the number of companies participating in the hauls, the storage capacity of the lines and their patrons, and the requirements of shippers, the examiner in his second proposed report recommended that it did not seem desirable for the Commission to fix a minimum tender that would be applicable to all the interstate crude pipe-lines respondent in tthis case.[22] In its decision and order in *Reduced Pipe-Line Rates and Gathering Charges*, the Interstate Commerce Commission required the respondent carriers to show cause why the tender requirements to be filed at a reasonable maximum and observed by each respondent without requiring a uniform tender rule for all should not be fixed at a maximum limit of 10,000 barrels.[23]

Pipe-Line Tariffs

Petroleum pipe-line tariffs are much simpler than railroad freight tariffs, upon which they are modeled. The pipe lines engaged in interstate commerce are subject to the provisions of section 6 of the Interstate Commerce Act requiring common carriers to publish, post, and file with the Interstate Commerce Commission their tariff schedules of rates and charges in the form prescribed by the Commission as a prerequisite to engaging in business.[24] Similar, but not identical, regulations of a number of States require the pipe-line companies to publish, keep open to public inspection, and file tariffs applicable in connection with intrastate commerce with the respective State commissions.

The rules and regulations of pipe-line companies are not uniform, so that generalization is difficult, but the regulations commonly included in tariffs are herewith described by groups as to content and general nature.

1. Oil offered for transport must be marketable or merchantable, properly settled, and contain no more than a stipulated percentage of sediment, water, or other impurities.

2. The carrier reserves the right to gage and test the oil for quantity and quality prior to its receipt for transportation, and to inspect, examine, and test it in consignee's tanks after delivery.

3. Pipe-line companies reserve the right to refuse to transport oil involved in litigation or subject to liens for charges, and the carrier may require the shipper to furnish indemnity bond to protect the carrier against loss arising from these causes.

4. The shipper must furnish the pipe-line carrier satisfactory evidence that the consignee of the oil is able to accept delivery promptly.

5. The carrier reserves lien upon the goods for all unpaid charges and the oil may be sold at public auction after tender of delivery to satisfy lien for charges. The carrier may require the charges to be paid in advance or to be guaranteed by the shipper, consignee, or owner.

6. Extra charges are made for special and terminal services, including gathering services, storage, demurrage, transfer, blending in transit, and loading the oil into tank cars or vessels.

7. Storage incident to the transportation of the oil is furnished without charge for a limited period, usually 5 days, after tender of delivery has been made. Thereafter, storage is provided at rates published in the tariff.

8. In connection with the transportation of crude petroleum it is provided that lots tendered for shipment to established delivery points may be stored in facilities furnished by the shippers at places intermediate to destination.

9. Regulations pertaining to the liability of the pipe line and claims against it provide that in the absence of neglect on the part of the carrier, its liability is limited to exclude responsibility for loss, damage, or delay caused by an act of God, fire, flood, riot, insurrection, rebellion, war, act of the public enemy, quarantine, authority of law, or act or default of the shipper or owner. Losses from these causes are apportioned pro rata among the owners of the oil in the carrier's lines. A special type of transportation service sometimes provided by pipe-line companies is the movement of petroleum short distances between the storage tanks of industries or between industrial storage tanks and tanks at junctions of connecting pipe lines. Special charges are made for this transfer service.

Gathering-line tariffs provide rates, rules, and regulations applicable to the gathering of the petroleum at the wells and the movement to and storage at the concentration points.

Similar to the crude oil pipe-line tariffs are those published to govern the transportation of gasoline. The pipe line may require from the proposed shipper

[21] *Brundred Brothers v. Prairie Pipe Line Co., et al.* 68 I. C. C. 458 (1922).

[22] Examiner's proposed report in I. C. C. Docket No. 26,570, sheet 29.

[23] 243 I. C. C. 115, 136 (1940).

[24] Interstate Commerce Act, sections 6(1), (2), (3), (4), (6), and (7)

separate pipeage contracts in accord with arrangements before any duty of transportation arises on the part of the pipe-line company. Gasoline is received for transportation at such time as gasoline of similar quality and specifications is currently being transported from the receiving point. Deliveries of oil are made wholly or in part at any terminal on the lines of the company or its connecting pipe lines as stated in the local or joint tariff issues of the pipe-line carriers who are parties to the joint arrangements. Gasoline of the required specifications is accepted for transportation in shipments of not less than 50,000 barrels from one consigner to one consignee. A number of refined oil pipe lines require as a minimum, tender lots of not less than 75,000 barrels. The pipe-line carriers are not required to transport gasoline except with reasonable diligence considering the quality of gasoline to be transported, the distance of transportation, and other material elements.

The services of blending-in-transit of gasoline or motor fuel compounds is performed by the refined oil pipe-line companies at their terminal without charge except that the materials or their cost must be furnished by the shippers. Refined oil pipe lines publish proportional rates, lower than their local rates, which can be used only in connection with rates on gasoline published by railroads to establish combination through rates by pipe line and railroad. Provision is made for the absorption by the refined oil pipe lines of the switching charges of rail carriers between the pipe lines' loading racks and delivery points in the switching limits of the terminals. Rates and charges named in the tariff cover services performed by the pipe-line companies in loading tank cars and in the billing of the shipments of gasoline.

Pipe-Line Rates

A study of 196 typical pipe-line rates applicable in 1932 indicates that the rates for trunk pipe-line transportation of crude petroleum from corresponding points of origin to the same points of destination were about 45 percent of railroad rates. The pipe-line rates ranged from 12 percent to 111.4 percent of the corresponding railroad rates. The average revenue for these movements by pipe line was found to be approximately 48.9 cents per barrel; the average revenue for the corresponding movements by railroad was 86.7 cents per barrel. The average pipe-line rate was 0.7167 mill per barrel-mile; the average by railroad was 1.603 mills per barrel-mile.

A comparison of 878 crude oil rates by pipe line and railroad between corresponding points of origin and destination, made in 1934 by R. Van A. Mills, showed variations in the relationship of pipe-line to railroad rates with pipe-line rates ranging from 6 to 105 percent of corresponding railroad rates; the most common range was from 30–50 percent and 41 percent was the average relationship.[25] The inference to be drawn from these samples is that with a few exceptions little or no attempt has been made by railroads to meet pipe-line rates on crude petroleum.

The trend in railroad rates on petroleum products has generally been upward since 1916 while rates upon crude petroleum have decreased. These decreases resulted from changes in individual rates and not from general decreases. Pipe-line rates, on the other hand, were increased generally in 1920, and were decreased upon several occasions since 1922. Few changes of major consequence were made during 1932 or 1933 but in the late spring and summer of 1934, a number of petroleum pipe-line companies filed tariffs with the Interstate Commerce Commission providing for substantial rate decreases. In June, 1934, the Interstate Commerce Commission ordered on its own motion an investigation into the lawfulness of the reduced trunk pipe-line rates and gathering charges provided for in these tariffs. During the hearings testimony introduced by the carriers tended to show that the average reduction in rates made by the carriers was about 35 percent from those in effect in 1933.

A study of 137 rates on crude petroleum via pipe lines and railroads from typical Mid-Continent, East and East Central Texas, West Texas, Texas Gulf, and Appalachian fields to ports, refining centers, and junction points in Southwestern, Western Trunk line, Central Freight Association, and Eastern territories undertaken by the author in August, 1940, showed that the pipe-line rates on crude petroleum for these representative movements were approximately 34.77 percent of the prevailing railroad freight rates between corresponding points of origin and destination.

The situation with respect to rates on gasoline and refined oils by pipe line and railroad differs materially from that in crude oil transportation rates. Policies of pipe-line companies vary greatly in making rates on refined petroleum. Certain of the largest pipe-line companies serving the Mid-Continent Field and Middle-Western distributing centers formerly made rates on gasoline approximately equal to the railroad tank car rates between the same points of origin and destination, and constructed proportional rates variously lower than the rates from the principal points of origin to the major terminals to be used when the gasoline moved by rail from pipe-line terminals to

[25] Mills, R. Van A., *The Pipe Lines' Place in the Oil Industry*, New York, 1935, pp. 112–130.

points of distribution or consumption. These proportional rates are made in such a way that the combination of the proportional pipe-line rates from points of origin to the pipe-line terminals plus the rail rates from the pipe-line terminals to the final destination are less than the direct all-rail rates from the points of origin to the final destinations.

Gasoline rates from the Southwest to the Midwest were found almost equal via pipe lines and railroads averaging 1.161 cents and 1.169 cents, respectively, per ton-mile on an average haul of about 566 miles. From the Eastern seaboard over an average distance of 215 miles pipe-line rates were 0.882 cent as compared with rail rates of 2.215 cents. A study of 81 representative pipe-line and railroad gasoline rates in effect September 1, 1940, including rates for movements in the Southwest, Midwest, and Eastern sections of the United States, show that the average pipe-line rate was 63.17 percent of the railroad rate. Table 11 presents a brief summary of average relationships of pipe-line and railroad rates on crude petroleum and gasoline. This fragmentary information indicates that the level of pipe-line rates on crude oil relative to rail rates has been decreasing in recent years. It indicates also that the gasoline-rate structures vary greatly in different sections of the country.

TABLE 11.—*Average Relationship of Pipe-Line to Railroad Rates on Crude Petroleum and Gasoline*

Year	Ratio of pipe-line to rail rates		Reference
	Crude petroleum	Gasoline	
	Percent	*Percent*	
1932	44.7		Federal Coordinator of Transportation, Section of Transportation Service, December 1932.
1934	42.1	Southwest to Midwest, 100 East to Midwest, 40 Average 70	Ibid, August 1934.
1934	41.0	East to Midwest 43	R. V. A. Mills, *The Pipe Lines' Place in the Oil Industry*, 1935.
1938	35.7		243 I. C. C. 115, 124, (1940).
1940	34.8	Average—63.17 East to Midwest 42.5	G. Lloyd Wilson, August 1940.

Recently there has been much discussion of the possibilities of establishing multiple-car rates upon gasoline and other refined petroleum products substantially below the prevailing carload rates. Several remedies have been suggested to permit the so-called independent producer to reach his markets in face of competition with producers who have their own pipe lines or tank steamers or who can offer oil in large lots to pipe lines. One remedy calls for the removal of gasoline and crude oil lines from control by refining companies so that the lines will be common carriers in fact as well as in law. A second alternative proposes the creation of a government control authority to enforce common-carrier practices. Ownership would thereby remain as it is, but the law would be more rigidly enforced. It is urged that the "commodities clause" be applied to pipe lines, so they be prohibited from transporting oil owned or produced by them. Another plan suggests that "pipe-line costs of transportation" be accepted "as an accurate measure of the value of transportation services performed by rails" and that rail rates be reduced "to competitive levels." [26]

Investment, Revenues, and Costs

The 63 pipe-line companies under the jurisdiction of the Interstate Commerce Commission reported an investment of about $830,000,000 and a net investment after depreciation of $384,313,115. Operating revenues for these companies in 1939 amounted to $168,000,000 for trunk lines and $44,000,000 for gathering lines. Revenues came almost wholly from transportation charges, those from storage and rent being relatively small. Total net income of all these companies was nearly $81,000,000. Six companies showed a deficit in pipe-line operating income and five showed a deficit in net income. Total operating expenses amounted to $97,000,000, divided as shown in table 12. The average operating ratio was 57.73 percent for gathering lines and 42.60 percent for trunk lines.

TABLE 12.—*Operating Expenses of Pipe Lines Reporting to the Interstate Commerce Commission, 1939*

[Thousands]

	Trunk lines	Gathering lines	Total
Total	$71,601	$25,529	$97,130
Maintenance [a]	36,598	10,191	46,789
Transportation	25,130	10,707	35,837
General office salaries and expenses	4,775	2,630	7,405
Other operating expenses	5,098	2,001	7,099

[a] Maintenance expenses include depreciation where charged but do not include taxes.

Source: I. C. C. *Statistics of Oil Pipe Lines Companies*, statement No. 4044, 1939.

An analysis of operating expenses of the 55 crude-oil trunk lines reporting to the Interstate Commerce Commission in 1939 shows that the cost of trunk-line operation ranged from 0.009 cent to 0.882 cent per barrel-mile, an average of 0.023 cent per barrel-mile. Combined costs of gathering-line and trunk-line operation for petroleum transported by the trunk lines ranged from 0.017 cent to 1.264 cents per barrel-mile, an average of 0.033 cent per barrel-mile. Operating expenses of refined oil lines indicate that for the year ending December 31, 1939, cost of trunk-line operation

[26] Shatford, John E., statement prepared for the Temporary Economic Committee, Exhibit No. 1184, hearings before T. N. E. C. part 15, *Petroleum Industry*, section II, October 1939, p. 8544.

TABLE 13.—*Average Cost Per Barrel-Mile for Gasoline Transported by Major Oil Companies, 1929–38*

[Cents per barrel-mile]

Company	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
Tide Water Associated Oil Co.	0.2140	0.2580	0.2600	0.3680	0.4420	0.3870	0.2870	0.1290	0.1230	0.4590
Pure Oil Co. (The)										
U. S. Pipe Line Co.				4.0855	.4121	.5953	.4378	.2746	.2446	.2429
Detroit Southern & Toledo Northern					.1027	.0903	.0687	.0617	.0645	.0813
Standard Oil Co. (Ind.)	(a)	(a)	(a)	(a)	(a)	(a)	.2626	.2440	.1872	.1995
Union Oil Co. of Calif.		.0900	.0600	.1100	.1300	.1400	.1400	.1000	.1000	.1300
Standard Oil Co. (Ohio)									.1020	.1020
Sun Oil Co.			.1470	.0883	.0951	.0830	.0891	.0794	.0706	.0693
Atlantic Refining Co.			.1874	.1161	.0959	.0944	.0952	.0738	.0721	.0675
Phillips Petroleum Co.			.0498	.0729	.0654	.0660	.0617	.0694	.0624	.0592
Standard Oil Co. (N. J.)		.1859	.0959	.0908	.0853	.0706	.0667	.0535	.0508	.0521
Cities Service Co.										
Louisiana Oil Ref. Corp.				.0880	.0680	.0730	.0520	.0470		
Arkansas Fuel Oil Co.								.0450	.0440	.0460

[a] Not reported.

Source: Temporary National Economic Committee, Petroleum Industry, 1939, part 14-A, p. 7796, table 21.

ranged from a low of 0.027 cent per barrel-mile to 0.175 cent per barrel-mile, averaging 0.041 cent per barrel-mile.

The two principal items of pipe-line cost are labor and depreciation. After these come taxes and fixed and general overhead expenses. In recent years proportions of total costs represented by taxes, fixed and general overhead expenses, and labor have increased Whereas depreciation has decreased relatively.[27] Costs per barrel-mile vary widely between companies and in different years due principally to variations in load factor, length of haul, wages, taxes, and depreciation. It is also generally true that trunk lines have lower unit costs than gathering lines, and that costs are higher for shipping refined oil than for crude. A study of the costs (including a 6 percent return on net investment plus cash, materials, and supplies) of 10 representative pipe-line companies showed the following cost per barrel-mile in 1939:

Refined oil lines (cents)	*Crude oil lines (cents)*
1. 0.10458	1. 0.0996
2. 0.13524	2. 0.0671
3. 0.16298	3. 0.0445
4. 0.08254	4. 0.0458
5. 0.05936	5. 0.1849

The great variations in these figures may be accounted for almost entirely by the different load factors affecting these lines.

The Temporary National Economic Committee compiled average cost figures for 12 major refined oil lines from 1929–38. These costs, shown in table 13, range between 0.046 cent per barrel-mile to 0.459 cent.

A general estimate of costs of transporting oil by railroad, tanker, and tank truck was made by Fayette B. Dow in the hearings before the Temporary National Economic Committee:[28]

The Transportation facilities * * * came into use mainly for one reason: that each new method was cheaper than its predecessor. How much cheaper is a question that cannot be answered either comprehensively or with entire accuracy even as to selected movements. Statistical reports are incomplete, and even if complete would have only temporary validity because the transportation evolution * * * is in full swing and last year's vehicles of transportation or their costs may not be representative next year.

All that one can do in this situation is to give figures that are fragmentary, but which definitely indicate certain trends. These trends in petroleum transportation are readily explained by the wide differences that are indicated in costs. The economy of bulk movement of both crude and refined oils has led to new kinds of equipment and new uses of old means of transportation.

Because tank trucks are still predominantly used for local deliveries, the ton-mile cost of these short trips is so high that an average does not show the economy of tank truck movement. While tank trucks were first used to replace tank wagons drawn by horses, on local deliveries, in recent years the movement of petroleum by tank trucks has substantially outgrown the local delivery status. Improved highways and the construction of tank trucks with larger capacities have substantially increased the length of haul.

Tank truck costs vary so much as to render any comparison useless which does not take into account the length of the haul, the number of stops and the conditions of the route traveled.

The variations in costs and in charges are not limited to the field of motor transportation. The operation expenses of crude oil pipe lines aptly illustrate the influence of two factors—the percent of maximum capacity used and the length of haul which caused wide variations in a pipe-line's expense. An analysis of pipe-line company replies to the questionnaire of the Interstate Commerce Commission, in Docket No. 26,570, *Reduced Pipe-Line Rates and Gathering Charges* * * * will indicate that pipe-line expenses per unit-mile vary inversely with both of these factors. Other factors also influence the expense of operating each of the agencies employed by the petroleum industry in moving its products.

Estimated costs of transporting oil by railroad pipe line, tanker, and tank truck are shown in table 14.

The pipe-line systems of the country are well established as the leading inland carrier for crude oil and are continually expanding their traffic in refined prod-

[27] *Reduced Pipe-Line Rates and Gathering Charges*, 243 I. C. C. 115 (1940).

[28] T. N. E. C. hearings, *Petroleum Industry*, part 15, 1939, pp. 8591–8592.

TABLE 14.—*Approximate Average Costs of Transportation by Pipe Line, Railroad, Tanker, and Truck*

Railroad	8.3 mills per ton-mile.[1]
Pipe line	3.2 mills per ton-mile.[1]
Tanker	1.25 mills per ton-mile.[1]
	.7 mills per ton-mile (crude oil) and 0.8 mills per ton-mile (gasoline).[2]
	3.0 cents per ton-mile (hauls of 100 miles or more).[3]
Tank trucks	5.0 cents per ton-mile (short hauls).
	1.5 to 2 cents per ton-mile on average hauls of 150 to 400 miles.[4]

[1] Pogue, Joseph E., *Economics of the Petroleum Industry*, 1939, citing Lisle, *Tanker Technique, 1700–1936*, 1939, p. 9.

[2] *Oil Price Handbook, National Petroleum News*, Cleveland, 1938.

[3] Study of tank-truck operations, Washington State Department of Public Works, 1938.

[4] Annual reports of three companies to I. C. C. (1939), cited by Fayette B. Dow, Esq., in Hearings Before Temporary Economic Committee, *Petroleum Industry*, part 15, pp. 8591–2, 1940.

ucts. Their costs of operation are so far below those of rail and motor carriers that these carriers will be relegated increasingly to the short haul, small lot, and temporary business. On the other hand, tankers and barges operate at much lower costs than pipe lines, and it is doubtful whether the large volume of traffic to the Atlantic seaboard will ever move other than by water except in a war emergency. In this connection, however, it should be remembered that most water cargoes are originated inland and move by pipe to the ports for transshipment.

In the immediate future, new pipe-line construction will probably be hampered by the inability to obtain steel, which is needed for other defense uses. The increased demand for petroleum will have to be supplied by more complete utilization of existing facilities supplemented by tank cars and possibly vessels. However, after the emergency it seems certain that the refineries will resume their programs of pipe-line expansion.

PART II—SECTION VI
RAILWAY TRANSPORT

By J. W. Barriger III[1]

Function of Transportation

The productive processes of a Nation are termed its "economy." It is not a chance word; there is significance in the term. It was wisely and consciously chosen for the reason that it puts the emphasis on doing work, i. e., growing or mining or making a product or providing a service, with the greatest possible economy. The measure of economy is the relationship between the material and labor actually utilized, compared with the material and labor which should be adequate for the purpose under the most efficient producing conditions and best supervision. A nation has a successful economy when each component part of its total work is done with the minimum quantities of material and labor which effective planning, equipment, and supervision will permit, thus producing a maximum quantity of goods and services and establishing the highest possible standard of living for its citizens. A negligible number of people in this or any other country have all of the material things and intangible services which they need or desire. No Nation has had the capacity to make enough for everybody's wants. It is essential to produce goods and services economically because doing so leaves labor and material available for other work which will help satisfy innumerable unfilled wants. There never was a time in the history of the world when the necessity of both an "economy," and economy, the desirability of them, and the logic of them were more clearly self-evident than right now.

The goal of economy is to lower cost of production and expand markets. These in turn reabsorb the employees who may have been temporarily adversely affected by more economical production which has enabled a unit quantity of the same work to be done by a smaller number of men. The route to social advancement and higher standards of living is through economy of production, which reduces expense, raises wages, widens markets, creates capital, and increases employment. In order to provide for the enlarged markets, additional productive capacity must be built. This requires capital. The earning power of industry provides part of this capital in the form of surplus earnings which can be reinvested. Outside capital is made available through the credit which the industry derives from its earning power. These two sources provide capital in the form of money needed for expansion and improvement, which in turn create other employment both to construct and operate new plant capacity. In a healthy, well-ordered economy of free enterprise this is a never-ending process which builds the high road to prosperity and improved standards of living along which the United States has continually traveled except for brief but trying interruptions.

The single purpose for which railroads exist is to produce a high quality of transportation at a low cost. This goal should never be sought through substandard wage scales or working conditions which are unfair or injurious to employees, but within the limits of fair wages and working conditions. The greater the effectiveness with which management, aided by capital, utilizes labor, the lower the transportation cost will be and the higher the service standards. Continual advance in the efficiency of utilization of labor and capital must also be shown to prove that railroad management is satisfactorily discharging its duty to the public.

Specialization or the "division of labor," is the basis of increased productivity in every form of enterprise whether agriculture, mining, forestry, manufacturing, or transportation. This has led to concentration of production in limited areas where particular geographical, social, climatic, or other factors afford special advantages for growing, mining, or making any particular commodity or article, or performing any service. Cheap and dependable transportation is essential to specialization, because this type of service makes it unnecessary for any area to be self-contained and assures a cost of living reasonably uniform throughout the nation. In the early years of the history of the United States every community had to be as nearly self-sufficient as possible but as transportation improved, each area could begin to center its economic activity upon growing or making only those things for the production of which it possessed special advantages. Districts began to specialize in agriculture, forestry, mining, manufacturing, or performing commercial or other services. Each could then produce their respective commodities, articles, or services at such relatively low costs and sell them to the outside world in such large quantities that the income derived therefrom would enable these communities to purchase all of those

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many things which they lacked special advantages to grow or make. Whenever the various parts of a nation and the many countries of the world limit their economic activities to whatever each possesses special advantages to do and then trade their respective products or services with others for the ones which the latter can make best, a higher standard of living is obtainable than is possible under any plan of local or even national self-sufficiency. The resulting division of labor and centralization of industry has required economical transportation which in its turn is a highly specialized activity.

Low cost movement of goods is a principal factor underlying this country's standards of living which are founded upon great development of agriculture and industry throughout a nation of continental proportions trading freely between all parts of itself and with all the world (at least in times of peace). Cheap transportation, afforded by a high degree of specialization, permits certain areas of limited territorial extent, in this and every other nation, to become great producers of one or more of the many individual commodities and types of manufactured goods. As a nation grows and develops it spends more and more money for transportation, both in amount and in relation to the total volume of business done. Cheap transportation leads to great increases in the aggregate expenditure for such service, through permitting specialization which affords savings in the unit cost of production and distribution of all articles of commerce, more than offsetting the expense of longer hauls. The more the unit cost of transportation can be reduced, the greater the distance that commodities and products can be moved in order to obtain the economies which result from concentration of production. It follows that when production is being diffused or decentralized in order to reduce transportation costs of assembling raw materials or distributing finished products, a regrettable process that has recently been going on in this country, there is positive proof that the handicaps which will be outlined herein have prevented the railroads from adequately performing their function in the national economy. Were railroads operating on a consolidated mass production basis, the added production costs of decentralized operation of industry would be much greater than the transportation savings which could be realized from using less of the latter service.

Growth of American Railways

Railways, through private enterprise, developed this continent with phenomenal rapidity and in so doing transformed the United States from a weak Nation into one of the great powers of the world. The construction of this country's railway system was a glorious national achievement and constitutes one of the finest chapters in American history.

The major problem confronting the early railroad builders was to complete their tasks as quickly and as thoroughly as possible with the available tools and experience. Projecting railroads into a wilderness was a highly speculative venture and, since capital was limited, it sought gains which led to some financial abuses. Moreover, the growth and development of the individual companies were not always achieved through the most prudent of corporate processes. Whatever mistakes may have been made during those earlier years were largely paid for by the losses of original investors. As the industry became more stabilized and its major function became the operation and development of existing lines rather than the construction of new ones, financial policy steadily became more conservative and most of the errors which had been incorporated in early capital structures were gradually liquidated through foreclosure and reorganization or by plowing the undistributed earnings of growing companies back into the properties.

To spread population, agriculture, forestry, mining, and manufacturing over a great continental nation such as the United States, it has been essential to overcome to the fullest possible extent the obstacles which distance, mountains, deserts, and obstructing bodies of water interpose against inter-state commerce. That is, of course, the very purpose for which the railway network has been developed. However, providing the physical facilities was only the beginning: a rate structure had to be developed to foster the basic purpose of transportation in the United States which was to develop a nation of continental proportions and bind it together as a political and economic unit. In order to do this it was necessary to enable the distant producers, as well as ones nearby, to compete as far as possible, in the same markets.

Such a principle of rate-making has been of paramount importance to the economic growth and strength of the United States. The theory has been to establish a price for high-valued and short-haul traffic, which could afford to pay a heavier charge per unit of service (when railroads were inland transportation monopolies), sufficiently high to produce revenues that would enable lower rates being made for low grade and long-haul tonnage. Thus, railroad tariffs, made in the past on the "value of service" principle, were higher for some traffic than was necessary on a post-of-service basis. Some component factors in railroad costs are fixed, irrespective of distance, and short-haul service has always been relatively expensive to provide; nevertheless, the actual charges for it and on commodities

possessing high value per unit of weight or volume, in many cases, have been above those necessary for profitable operation. The rapid development of the United States proves that this rate-making practice was eminently sound, practical, and effective, because it achieved its purpose of securing nationwide distribution of goods and allowed each section of the country to specialize in producing whatever it could make best.

Regulation

From the outset railroads have been the object of special political interest. Unfortunately for these carriers, a long series of political actions, partly through legislation, partly through regulation, and partly through pressures exercised in less formal manner, has cumulatively added artificial burdens to operating expense and prevented the railroads from attaining their full potentialities for economical transportation. There has been simultaneous political pressure from other quarters to keep rates low irrespective of expenses and compensatory return.

The special economic characteristics of transportation as a "joint cost" or "common cost"[2] enterprise quickly led companies performing this service into destructive competition with one another whenever there were any material differences between them in respect to traffic position and financial stability. This unhealthy condition manifested itself in the past principally through rebates and other improper concessions to large shippers, usually in secret. Since transportation expense is a factor in the cost of everything, those who gained a handicap over business rivals in rates or service possessed an unfair advantage particularly if it was a hidden concession. One of the purposes for which railroads were brought under the power of regulatory commissions was to stop such discrimination, but not to equalize business opportunities between competitors or compensate for other factors wholly unrelated to the sale of railway transportation at published nondiscriminatory and nonprejudicial rates.

Unwilling to face squarely the consequences of past mistakes and inconsistencies which in effect decreed that it should be the national railway policy to require higher than necessary railway operating costs, the public representatives and authorities fostered subsidized (and long unregulated) competitive transportation. Paradoxically enough, motor transport and water lines, even though subsidized, have had to hold their standards of wages, hours of service, and working conditions below those established by the railroads in order to obtain many of their competitive rate advantages. Political considerations have made railway costs higher than necessary and then, to circumvent the resulting service charges, other political actions were considered necessary or expedient, partly to provide service below railway tariffs and partly to force the latter downward. This took traffic away from railways, employment away from their workers, and income from their security holders. These conflicting political factors have further drawn the railroads into an unduly inflated position with respect to their costs, and an unsound position with respect to the rates which they may charge. They may not be able to survive permanently as a private industry unless they are relieved of artificial drains upon their traffic and financial resources.

In order to prevent the large shipper from gaining the benefit of wholesale prices through an ability to offer freight in very large quantities, commissions in effect "froze" the pricing of freight service into two fundamental classes: less than carload freight and the single carload. The latter was established as the largest unit in which railway transportation could be bought so that a price advantage would not be obtainable by those who were able to buy railway service in multiple-car or trainload lots, lest resultant lower rates threaten the existence of their smaller competitors. However, all users of transportation, whether large or small, have been constantly trying to secure transportation costs below those offered by the railroads.

The complete elimination of the railway's monopoly of inland transportation and the growth of private, contract, and public carriers by highway, waterway, and pipe line permit shippers, large and small, to gain those very advantages over their rivals which railway regulation was designed to prohibit. The changed conditions prevent continued fulfillment of the original objective of regulation, i. e., to deny any shipper the right to obtain transportation on a basis below the standard carload or less-than-carload rate. Rate-making practices should be revised whenever competitive transportation conditions have circumvented its objectives, and transportation is being bought elsewhere or privately produced for less than the published charges for railway service. Railways should not be required to retain prices and pricing methods which serve no other purpose than to prevent them from securing traffic which they could move at a profit on a modified basis of sale. It is not, or should not be, the purpose of regulation to deny railroads the right to obtain any traffic which they can haul profitably and without prejudice or discrimination against other shippers.

[2] See distinction in Healy, Kent T., *The Economics of Transportation in America*, 1940, pp. 161–163.

The tendency to base rail rates upon "value of service" has brought about a relatively high rate structure on desirable volume traffic which later enabled motor-trucks, the higher cost producers of transportation (except in limited fields), to pick and choose traffic and expand far beyond their sound economic radius. Also, the percentage increases which have been made in the rate structure since the original "value of service" theory was devised have greatly distorted the original idea and made the higher-rated railroad traffic still more vulnerable to capture by competitive agencies. Traffic erosion seldom results from any fundamental economy inherent in motor transport for moving important aggregate tonnages or numbers of passengers, but occurs because motor transport agencies possess superior flexibility in competitive pricing and in adapting their operations to the wishes or needs of their customers. The inertia of regulation has made it very difficult for railroads to meet this condition without upsetting the entire rate structure which would have entailed far greater revenue losses than could have been offset by the traffic gains sought.

Railway regulation was introduced as a substitute for price competition when the latter was thought to be unable to insure good service under reasonable and nondiscriminatory published tariffs. Now that railways have lost their monopoly of inland transportation and constant attrition of their traffic and earning power seriously beclouds their long-term outlook, it appears that a new era of regulation should promptly be opened by relaxing the very comprehensive rate controls exercised by State and Federal commissions. Their power over rates should now be limited, as when first established, to prevent discrimination and prejudice in railway rates or service against shippers, places, and commodities, but the actual level of rates (though published and subject to review) should be left primarily to competition to establish. Railways should be allowed to make multiple-carload and trainload rates, and to enter into "agreed on" rates based upon the willingness of an entire industry or individual shippers to use railway service for a stated minimum proportion of their transportation.

Much restrictive regulation pertaining to railroads has been placed on the statute books, purportedly in the interest of safety or service, but which actually interferes with both and serves only the objective, quite apparent from a study of the legislative proceedings, of adding unnecessary jobs to pay rolls. It is for similar reasons that legal restrictions surround consolidation of railways in order to prevent the carriers from making economies which would admittedly be obtained through greater individual productivity, but which alone can provide the lowest remunerative rates and open the way to the improved service which lawmakers, the public, shippers, and commissions all profess to desire, but actually do so much to hinder.

In this dereliction, neither management, the worker, nor the absentee landlord can disclaim participation. State and local authorities have also opposed the abandonment of unprofitable operations in order to preserve this source of tax receipts and for other arbitrary purposes designed only to add to railway-operating expense. The rate-making bodies are not coordinated with those created to review personnel matters and both are largely independent of any responsibility to consider the many restrictive regulations which add so much to railway costs. Management is caught between these several governing forces, and the lack of coordination between the latter further handicaps the former's opportunities to solve the industry's ever-present, but ever-changing, problems.

All of this inevitably stifles private initiative. Unfortunately too little consideration appears to have been given by regulatory commissions or management to finding out whether established charges for railway services may be higher or lower than is consistent with those principles of good merchandising which would insure sale of a maximum volume of railway transportation with consequent continuous full employment and satisfactory compensation for labor and capital. Regulation has also been used too frequently as a medium for requiring the railroads to absorb the shock of the economic ills of industry and agriculture for which the railroads are not responsible, with the result that the carriers have been further deprived of a fair opportunity to produce income. Arbitrary readjustment of railroad rates should not be used to equalize competitive advantages and disadvantages as between industries and between regions.

Labor in the Railroad Industry

Original construction of railroads and their continued operation, maintenance, and development provide gainful employment for labor. Labor and capital are mutually dependent upon one another in the railroad as in all other industries. Neither can work alone; both must have management to coordinate their respective functions in order that all three shall do what is required of each to permit the industry to grow. Simply stated, duty requires that their efforts be directed to securing an ever-downward trend of rates, in relation to price indexes, and simultaneous raising of standards of service. Occasional temporary sacrifice may be required of the partners—management, capital, or labor—but the common goal of improved and more economical service to the public and increasing revenues to divide between wages, salaries, and in-

come can never be reached if any one or all of them demand and obtain more than a fair share of the fruits of increased efficiency which come from their joint efforts. All of their interests must be considered concurrently so long as our present scheme of political democracy continues. If the welfare of capital is ever long ignored by labor or management in the pursuit of their own interests, the economic organization of this Nation will be undermined.

When the American railways are allowed to operate on principles which will permit lower production costs and better service, it will not put men out of work but will create an economic balance in production and distribution which is vital to the future welfare and continued growth of the Nation. The way to double the number of men employed by the railways is to increase by one-half, and not reduce by one-half, the productivity of each individual employee. Substantially raising the individual output, with consequent decrease in costs and rates, will stimulate the demand for railroad transportation. On the other hand, to halve the productivity and double the cost would prostrate the railways and all industries that would remain dependent upon them for transportation. After a "functional reorganization," carriers could proceed to assert their superior economy and modernize their rate structure and commercial practices in order to place them on a competitive basis which would regain lost traffic, help reduce unit costs materially, and place them in a position to offer still more attractive rates and service. The million men now employed on American railways, even though producing far more per worker than they can do at present, would be insufficient to provide the transportation which could be sold at the lower rates then charged, and total employment would be increased. Under such improved operating conditions, the railways could also afford to pay wages representing a better standard of living for their employees than is now possible.

Labor fears that consolidation creates "technological unemployment." There has been severe unemployment over the past decade but it was due to causes other than the one so often ascribed to it. Technological improvement creates employment and does not cause unemployment. Overproduction has never existed and can never exist until goods and services are without value or utility to anyone, even if given away. The fact that goods exist which cannot be sold does not mean that there is overproduction, but that the distributive processes have jammed, usually through abuse of credit for nonproductive purposes. To reduce output, either in total or per individual worker, disorganizes the delicate mechanisms of production and distribution and aggravates economic problems rather than helps to solve them.

Legal machinery has been established to settle wage disputes and make awards, both with respect to basic pay and penalty compensations. Here, too, management lacks adequate authority to discharge its full responsibilities for most efficient and complete use of the property placed in its charge. In labor relations, as in many other functions, management can do no more than plead its case before Federal boards which, at least in this field, are usually bipartisan ones which commonly deadlock. This automatically leaves important decisions to single temporary referees, often lacking experience in and understanding of the technical background of the important matters on which they sit in judgment and without responsibility for the continuing welfare of the railway industry. Practically, the procedure established is such as to bring before the "disinterested third party," who decides wage controversies as well as those relating to interpretations of the schedules of working conditions, not the question of whether labor is entitled to more, but rather the question to how much more labor is entitled.

Change Rules the Industry

The basis of all progress is change. A change, irrespective of how great may be the benefits it bestows upon the general public, nevertheless, invariably inconveniences some people. Everyone endeavors to protect himself against anything being done which may be contrary to his personal advantage, even though for the public welfare. It is very easy for an individual to convince himself that his own wishes and the general interests of the Nation are identical, whereas often they may not be. Capital, labor, management, commissions, and railroad patrons have together put the railroads into a strait-jacket of laws, contracts, practices, regulations, and prejudices which have grown up over a half century. Each has endeavored, often successfully, to obtain a veto power over any change which it did not wish to have made. Too often this veto power is exerted by a minority interest for its own short-time and short-sighted personal and selfish gain. These continuously outstanding veto powers, part of which are its own, or of its own making, prevent railroad management from undertaking the fundamental changes necessary to produce service of such low cost and high quality that further traffic erosion will be stopped, and the larger part of that previously lost regained.

In order to permit industry to meet the vigorous and conflicting demands of labor, capital, and the public, management must have full access to applied science

and invention. Capital must continue to provide the funds needed to create the best plants and equipment which technical skill can design, and labor should, in its own interests, help by lending its efforts in the efficient operation of them. The development of America's principal manufacturing industries, not so arbitrarily restricted as the railroads, is the outstanding achievement of this greatest of all industrial nations and bears eloquent testimony to what management can accomplish when it is unfettered and has access to adequate capital. The railroads possess or have access to technical knowledge adequate to solve their problems, but lack the confidence of capital necessary to obtain funds in the large amounts needed to modernize the industry throughout. Investors know that railway management does not now have the freedom of action essential to make the changes in the fundamental principles of operation which alone will justify those expenditures.

Consolidation

Solution of the railroad problem lies in a "functional reorganization," not a "capital reorganization." The necessity of recapitalization of some companies is an outgrowth of the railway problem and was not a factor in causing it. The railroad problem must be met and overcome by reestablishing traffic, revenues, and net railway operating income and not by trying to find expedients for making a deficiency of all three a little less disturbing to the national economy.

In past generations, the genius of Harriman, Hill, Cassatt, Vanderbilt, and others endeavored to consolidate the railways of the United States into a limited number of great systems. The corporate amalgamations which they were undertaking were an essential prerequisite to the unification of operation necessary for the concentration of traffic and elimination of competitive duplication which alone would permit the continuous maximum development of railway plant at minimum aggregate capital cost. This Nation's reverse national policy of insisting upon a myriad of competing lines has hampered transportation progress and increased its capital and operating costs. Large-scale consolidation would have created much more highly developed systems had it been possible to concentrate capital investment in intensive improvement rather than use so much of it merely for attainment of maximum competitive duplication of services. The competitive waste which this produced has contributed substantially to the carriers' past and present difficulties and is the basis for the apprehension frequently expressed respecting the future of the railways as a private enterprise. Moreover, it has made them vulnerable to subsidized competitive transportation to which they would have been largely immune had solidation been consummated and the increase in railway investment of the past 30 years been used wholly for intensive development.

With the intensive physical development of railroad facilities that would have followed creation of great and strong systems, the railroads could have attained service standards at a low rate basis impossible under present operating conditions and with resultant levels of railway employment and distributable earnings on investment far above those now possible. Intensively developed plants, superior to any now in service and with smaller capital structures, in which stock and not bonds predominated, would have followed inevitably upon consummation of the mergers which the farsighted railway and financial leadership of a generation ago could have obtained if it had been left unchecked. Fortunately, it is not yet too late to recognize the past error which prevented the transformation of the American railways into systems designed to use mass production principles in transportation.

The object of building railroads was to use mechanical power to overcome the resistances which friction and gravity impose on inland transportation. The basic economy with which trains can be operated is determined by the magnitude of the forces which locomotives must expend in traversing the natural barriers existing in the fixed characteristics of grades, curves, and distances. The latter establish the work which must be done to move a ton of train weight over any line, and speed now adds a third dimension or "power" to railway operation which for many years was only concerned with two, i. e., weight and distance. The economy of train movement and related yard and terminal services is dependent upon the adequacy and the engineering standards of design, construction, and maintenance; and the fullest possible utilization of line, equipment, and facilities. Although part of these now embody the most modern standards which can be devised, by far the greater proportion represents standards inferior to the best. Through train movement should be concentrated, as far as possible, on a minimum number of routes, carefully selected because they are the lines with the shortest distance, lowest grades, and easiest curves; pass through the districts producing the heaviest traffic; represent the highest present standards of development; and can be further improved at least cost. This is also true in a comparative sense with trucks and waterways, but by their inherent limitations the latter are auxiliary and supplementary to rail transportation and

should be so recognized. All could then be intensively developed, and their respective total expenses, charges, and taxes, and the elapsed time from the point of origin to destination of both freight and passenger services could be so materially reduced that transportation would be immune to further traffic erosion and diffusion.

Through dissolution of past steps taken toward consolidation of railways into a few great systems and by legal restrictions or difficulties interposed against consolidation at present, the railroads have been denied the privilege of operating in accordance with the principles of mass production. In this era of great enterprise, such words as "superpower," "superhighways," "superliners," "superdreadnaughts," are appropriately utilized to describe the creations of engineering and executive genius and financial enterprise. The solution of the transportation problem lies in creating "superrailroad" systems out of the present operations in order that revitalized carriers can keep pace with the progress of mass production industries.

Railways have long been conducted on a basis that might be termed a "large-scale operation," but "mass production of transportation," which is the source of the prospective economies needed to revitalize the carriers, awaits further corporate consolidation into a limited number of very large systems. This is necessary in order to obtain the traffic concentration, earning power, and economy in use of new capital essential to permit such methods to be used. The improvement in operating technique supposed to result from the competitive effort of many separate lines striving for preference of patrons is more than outweighed by the resources which consolidated systems will have for development of their transportation plants after the advantages of traffic concentration have been obtained, and restored credit affords access to new capital which can then be used with maximum effectiveness. Moreover, the benefits of competition will be retained between all principal terminals of consolidated companies, and it is the rival long-distance services which now and in the future will establish the standards to which the operation of entire systems conform.

Consolidation will release much mileage which only duplicates other lines and serves no essential independent purpose, but contrary to the prevailing notion, it, alone, will prevent abandonment of many presently unprofitable or "marginal" lines. Mass transportation will reduce the unit cost of certain branch-line, as well as main-line expenses, and service improvements on the latter, together with general rate adjustments, will restore much of the traffic which the former have lost. The margin between revenues and expenses applicable to all light density mileage will be favorably affected by consolidation, the former going up and the latter being reduced per unit of service performed. These trends alone can save many branches that otherwise will be eliminated. It will always be beneficial to save nonduplicating mileage, if possible to do so without direct loss, because every such branch contributes some traffic that cannot be held for the other routes after the tracks on which it must originate or terminate have been taken up. Many presently unprofitable, nonparalleling branch lines serving an essential public service which consolidation cannot restore to a self-supporting basis, nevertheless can be justifiably supported by the financially stronger consolidated systems in many cases where it would now be impossible. It would not be unreasonable to expect consolidated systems to pay, in effect, a moderate "franchise tax" (for consolidated operation) in the form of continuing some unprofitable mileage that otherwise must be salvaged.

The problem of serving communities not on the primary main lines of consolidated railway systems will merely be a matter of providing adequate service over improved secondary main lines connecting the one with the other. Each railway system today successfully competes for traffic at many places, often important centers, not located on its main line but directly served by that of one or more rival companies. Connecting freight and passenger runs integrated into the through schedules, at convenient junctions, will continue to perform this function of extending main-line services into cities not actually on it.

The faster and more frequent schedules and lowered rates that can be obtained by introduction of mass production principles and methods into railway operation will reverse present unfortunate tendencies to "Balkanize" the United States. This will surely result if present attempts to make every State or section of the country more self-sufficient are carried too far. Mass production of railroad transportation would encourage each area, through lower freight rates and faster service, to confine its activities to the production of commodities, articles, or services for which it possesses distinct advantages and buy everything else it needs with the income derived from the greater values thereby created. Mr. C. S. Belsterling, General Commerce Counsel of the United States Steel Corporation, has analyzed these "Balkanizing" tendencies of decentralization with his characteristic power of keen analysis and cogent expression in an essay on "Transportation Atavism."[3] It should be required reading for every one who has any responsibility for the general economic welfare and development of the United States. This critique "debunks" the popular notions

[3] *Proceedings of New York Railroad Club*, April 1941

which see imaginary benefits in vain attempts of localities to become self-sufficient in order to economize on transportation and fail utterly to understand the peril of undeveloping the United States.

One of the purposes of consolidation is to simplify the present complex intercorporate relationships between many separate companies, particularly those which together form a principal route across any region. A well-considered reduction in the individual operating companies comprising the nation's railways will center and coordinate authority, reduce selfish disagreement, and eliminate a large amount of overhead and other existing duplications of effort. The simple associations between divisions of a common system will be substituted for the formal relationships between separate companies. This is necessary if the nation is to be permitted the advantage of the best and most economical transportation. Likewise, any unsound financial, traffic, or other practices which remain are internal faults that only consolidation can quickly and permanently eliminate.

The immediate savings of a number of hundred millions of dollars per year in operating costs resulting from mass production methods should be divided between the public, through rate readjustments which will produce traffic increases and consequent opportunity for reemployment of workers temporarily displaced; labor, first through financial protection against the resultant employment readjustments and later in higher wages; and security holders, through returns adequate to attract the new capital needed for the great program of modernization and development which the changed basis of operation will permit being undertaken. Growth of earning power exerts a multiple effect or "leverage" upon security values and hence upon credit. Increasing railway income by several hundred millions of dollars per annum will reestablish railway credit and enable $1,000,000,000 of new funds to be attracted into the industry each year, for development of a mass-production transportation plant. The expenditure of this money will provide far more employment than the operating economies of mass production can eliminate, even without giving effect to traffic increases resulting from declining rate levels and improving service.

The opposition to railroad consolidation which led to the dissolution of mergers undertaken in the first decade of the present century grew out of the fear of monopoly. Public-service institutions frequently are monopolistic in character; railroads were then, and unfortunately did not always recognize the obligation which such a position required be given to consideration of the public interests. In order to obtain the benefits of private enterprise in public-service corporations, regulation was devised to protect the public from abuse of power by a monopoly although permitting the operating companies to have stability of earning power upon their capital investments, which is an important factor in providing lower rates and better services. Monopolies need be feared only if unregulated. Railways have been regulated with growing completeness and effectiveness over a period of more than half a century. Moreover, the monopolistic position of the railways has been broken up by competitive transportation. There are now no grounds for apprehension of large-scale consolidation, and even before the advent of commercial and private motor vehicles, pipe lines, modern water carriers, and airways, there were no problems of railway consolidation which were beyond the power of regulation to solve.

The principal current objection to unification of the railway systems of the United States into a few semi-competitive systems is the widespread notion that the resultant increased productivity of labor would cause unemployment, since the present aggregate railway service could be performed by a reduced number of workers. It has, however, been the usual experience that substantial reductions in selling prices coincident with improvements in quality of products or services following the use of mass production methods enlarge markets more than proportionally to the effectiveness with which labor is utilized, and increased, rather than decreased, total employment results. Higher wages also follow. Since there may be a temporary period of readjustment before employment is increased by consolidation, those released from railway service or given less desirable employment as a result of unification should be adequately compensated over a stated period. This protection of the workers should be an essential condition of any permission to allow the carriers to merge.

Conclusion

This country is on the threshold of another great era of transportation progress, if the Government will only allow it to be realized. This requires removal of all artificial barriers which are preventing sound consolidation. Moreover, all those who have positions of responsibility within or affecting the railway industry must employ sound thinking to modernize operating and other practices instead of merely rearranging their prejudices and predispositions to no good result. Once again the scope of operations will have to be enlarged to obtain the traffic density necessary to utilize capital productively in property and service improvements. This will require that the operations of all companies in the same region shall be merged into not more than two systems in each. Such a uni-

fication will be required by the same basic factors which led to most consolidations of the past; the essential physical development of the properties and the related changes in operating technique must have such enlarged territorial scope as to require intercorporate action which can only be secured through some form of corporate amalgamation. Coincident with a merger, any unsound capitalizations should be revised to meet the high standards which should be set for the financial structure of the new operating companies.

Consolidation is the fundamental condition precedent to internal functional reorganization of railway operation. This cannot be undertaken until management has been concentrated into a few units and all securities of constituent lines are brought under the protection of the earning power of the integrated system to which it has turned over its traffic and it property.

The building of the American railroads was the mainspring of economic activity in this country for the greater portion of a century and the curtailed relative rate of development within the railroad industry has been a major factor contributing to the economic problems of the past decade. If a "functional reorganization" of the American railway is permitted and encouraged by the Government in order to allow these carriers to operate as an integrated mass production industry, the work of developing their properties will provide a decade of great industrial activity and, long before the completion of this work, the standards of railroad performance, measured by rates, service, wages, and capital return, will make it a permanent bulwark of industrial progress in this country and give it immunity to traffic erosion by competitive agencies. The "Golden Age of American Railroading" lies ahead if this nation will but realize how easily it can be had and how generally all individuals, industries, and communities will share in the benefits which it will bestow upon the United States.

PART II—SECTION VII

THE POSITION OF LABOR

By Edwin M. Fitch and Joseph M. Gillman [1]

The opposition of interests, which produces labor disputes, often obscures the many points at which employers and employees have interests in common. In the transportation industry, both labor and management have a common dependence upon the prosperity of the enterprises which require transportation services, upon consumer reaction to transportation-pricing policies and standards of transportation service, upon the effectiveness of many phases of public regulation, and upon the development of an adequate and integrated national transportation policy. It is probable that both employers and employees in the industry could agree on the objective of the industry as a "system of transportation for the Nation which will supply the most efficient means of transport and furnish service as cheaply as is consistent with fair treatment of labor and with earnings which will support adequate credit and the ability to expand as need develops and to take advantage of all improvements in the art." [2]

In the transportation industry, the area of agreement as to means as well as objectives has widened considerably during recent years. In several sections of the industry, labor organizations, for example, are no longer primarily concerned with the struggle to obtain recognition and contracts. These rights of labor have been accepted by a substantial number of executives and, to that extent, an important cause of grievance and dispute has been removed. Management has likewise greatly modified an earlier opposition to social insurance and on several occasions has co-operated with labor in supporting certain measures for employee security.

In somewhat the same way labor has tended to take a more active interest in problems once regarded as exclusively the concern of management. The Report of the Committee of Six appointed by the President in 1938 to "submit recommendations upon the general transportation situation" dealt with problems of competition, regulation, rate making, taxation, consolidations, railroad reorganization, and railroad finance.[3] There was practically no mention in the report of the problems of labor as such. Yet the report was signed by three high-ranking railroad officials and three high-ranking representatives of organized labor.

The labor problem in transportation, as in other branches of industry, is often regarded too narrowly in terms of disputes, with consequent emphasis on means of settling them. To an important extent this emphasis is necessary. At the same time labor-management conflicts can often be avoided more easily than they can be settled after they have occurred. Satisfactory labor relations are as dependent on an enlargement of the sphere of common employer-employee interest as on the modes and mechanisms of settling labor grievances.

The purpose of this study is to summarize the facts which are most essential to an understanding of the labor problem in transportation, to point out certain aspects of labor relations and labor standards on which there is substantial agreement in the industry or in large sections of it, and to indicate other aspects in which agreement might reasonably be expected.

The Transportation Labor Force

Employment Trends in Transportation

For the purposes of this study, the transportation industry is comprised of the for-hire or common carriers engaged in transportation by railroad, by bus and truck, by airplane, by pipe line, by street electric lines, and both for-hire and private carriers in water transportation. Of an estimated average [4] of 2,207,000 employees (full-time equivalent positions) in the industry in 1939, 1,115,000 were in railroad transport, 270,000 in water transportation (both domestic and foreign), 606,000 in bus and truck transport (both intercity and

[1] Chief Statistician, and Senior Economic Statistician, Bureau of Research and Information Service, Railroad Retirement Board.

[2] *Report of the Federal Coordinator of Transportation*, 1934, H. Doc. 89, 74th Cong., 1st Sess., p. 8

[3] *Report of Committee appointed September 20, 1938, by the President of the United States to Submit Recommendations Upon the General Transportation Situation*, December 23, 1938.

[4] *National Income Tabulations, 1929–39*, National Income Division, Bureau of Foreign and Domestic Commerce, U. S. Dept. of Commerce.

The inclusion in these estimates of motor-transport employees engaged in purely local operations exaggerates the importance of motor transportation in relation to railroads. The comparison would be somewhat more significant if only intercity and interstate motor-carrier operations were included, but such figures are not available.

Data assembled by the Railroad Retirement Board on the earnings of employees covered by the Railroad Retirement Act indicate that in the railroad industry the number of persons who perform some work for railroads during any given year is 40 to 50 percent greater than the average number of full-time equivalent positions. To a greater or less degree the same situation exists in other branches of transportation and accounts, together with incomplete data, for the possibility of wide variation in estimates of transportation employment. See *Annual Report of the Railroad Retirement Board for the Fiscal Year Ended June 30, 1940*, ch. XI

TABLE 1.—*Number of Employees (Full-Time Equivalent), by Industrial Groups*

[In thousands]

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Total number of employees	35,563	33,122	29,715	26,222	26,133	28,396	29,725	31,858	33,768	31,239	32,419
Transportation—total	2,961	2,747	2,405	2,063	1,989	2,071	2,103	2,256	2,372	2,115	2,207
Steam railroads, Pullman and express	1,847	1,659	1,406	1,155	1,084	1,124	1,113	1,194	1,250	1,061	1,115
Water transportation	287	273	236	205	226	234	245	259	285	250	270
Motor transportation and public warehouses	530	535	508	476	466	494	528	581	610	586	606
Street railways	269	252	228	203	187	190	187	188	190	182	180
Air transportation	3	4	5	6	6	6	7	9	11	12	14
Pipe lines	25	24	22	18	20	23	23	25	26	24	22

Source: United States Department of Commerce, Bureau of Foreign and Domestic Commerce, The National Income Division: *National Income Tabulations, 1929–39*, table 4.

TABLE 2.—*Number of Employees (Full-Time Equivalent), by Industrial Groups*

[By percent of total]

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Total number of employees	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Transportation—total	8.3	8.3	8.1	7.9	7.6	7.3	7.1	7.1	7.0	6.8	6.8
Steam railroads, Pullman and express	5.1	5.0	4.7	4.4	4.1	4.0	3.8	3.8	3.7	3.4	3.4
Water transportation	.8	.8	.8	.8	.9	.8	.8	.8	.8	.8	.8
Motor transportation and public warehouses	1.5	1.6	1.7	1.8	1.8	1.7	1.8	1.8	1.8	1.9	1.9
Street railways	.8	.8	.8	.8	.7	.7	.6	.6	.6	.6	.6
Air transportation	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Pipe lines	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1

[1] Less than 0.1 percent.

Source: Based on figures of table 1.

TABLE 3.—*Number of Employees (Full-Time Equivalent), by Industrial Groups*

[By percent of transportation total]

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Transportation—total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Steam railroads—Pullman and express	62.4	60.4	58.5	56.0	54.5	54.2	52.9	52.9	52.7	50.2	50.5
Water transportation	9.7	9.9	9.8	9.9	11.4	11.3	11.7	11.5	12.0	11.8	12.2
Motor transportation and public warehouses	17.9	19.5	21.1	23.1	23.4	23.9	25.1	25.8	25.7	27.7	27.5
Street railways	9.1	9.2	9.5	9.8	9.4	9.2	8.9	8.3	8.0	8.6	8.2
Air transportation	.1	.1	.2	.3	.3	.3	.3	.4	.5	.6	.6
Pipe lines	.8	.9	.9	.9	1.0	1.1	1.1	1.1	1.1	1.1	1.0

Source: Based on figures of table 1.

TABLE 4.—*Number of Employees (Full-Time Equivalent), by Industrial Groups*

[By percentage of 1929]

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Total number of employees	100.0	93.1	83.6	73.7	73.5	79.8	83.6	89.6	95.0	87.8	91.2
Transportation—total	100.0	92.8	81.2	69.7	67.2	69.9	71.0	76.2	80.1	71.4	74.5
Steam railroads, Pullman and express	100.0	89.8	76.1	62.5	58.7	60.9	60.3	64.6	67.7	57.4	60.4
Water transportation	100.0	95.1	82.2	71.4	78.7	81.5	85.4	90.2	99.3	87.1	94.1
Motor transportation and public warehouses	100.0	100.9	95.8	89.8	87.9	93.2	99.6	109.6	115.1	110.6	114.3
Street railways	100.0	93.7	84.8	75.5	69.5	70.6	69.5	69.9	70.6	67.7	66.9
Air transportation	100.0	133.3	166.7	200.0	200.0	200.0	233.3	300.0	366.7	400.0	466.7
Pipe lines	100.0	96.0	88.0	72.0	80.0	92.0	92.0	100.0	104.0	96.0	88.0

Source: Based on figures of table 1.

intracity and including about 120,000 owner truck drivers, 68,000 taxicab drivers, and 33,000 public warehouse employees), 180,000 on street railways (including 44,000 intracity bus drivers), 14,000 in air transport, and 22,000 on pipe lines.

The number of employees engaged in the transportation industry declined between 1929 and 1939 from 2,961,000 to 2,207,000 employees.[5] The decline was greatest in the railroad industry, both absolutely and relatively. The number of railroad employees in 1939 was 732,000 less than in 1929. The only other significant decline was that of 89,000 in street railways. Motor transport gained about 76,000 employees in the 10-year period, while employment in air transportation increased from 3,000 to 14,000. Insignificant declines occurred for water transportation and pipe lines.

The loss of railroad traffic during the 1930's and the consequent decline in railroad employment were, of course, greatly affected by the depression as well as by competition from other transportation agencies. Dur-

[5] The basic figures are given in table 1; percentages are given in tables 2, 3, and 4.

ing these years the traffic of all agencies of transport declined. But, with the possible exception of intercity electric railways, traffic on steam railroads declined relative to the total more than was the case for any other form of transportation.[6] This loss in volume of railroad traffic, which began in the early 1920's, has been due in large part to diversion to competing agencies of transportation, new as well as old. It has been due also to changes in the character and relative importance of the commodities entering into transportation in this country, to recent tendencies to locate industries closer to sources of raw materials and markets, as well as to a growing tendency on the part of large scale industries to operate a more or less complete transportation system for shipping raw materials to plants and finished products to market in substitution for the common carriers. Such industries include: oil, coal, copper, steel, lumber, automobiles, chain stores, and public utilities.

It should not be inferred, however, that the growth of competing agencies of transportation has all been at the expense of the railroads. Much of the traffic that exists today, especially passenger, is wholly new traffic, due to the development of new modes of transport, principally the automobile and bus. The loss of railway passenger traffic, for example, is relatively very small compared to the gain in highway passenger traffic. The total amount of transportation service used by the American people, including the use of the private automobile, is greater today than at any other time in history.

Occupations in the Transportation Industry

There are sharp contrasts in the occupational characteristics of each of the several branches of transportation which are important to any comparisons between them. In the railroad industry, about 20 percent of the employees are engaged in maintenance of railroad right-of-way and structures. No comparable group exists in any other branch of transportation, with the possible exception of pipe lines. Bus and truck operators are not responsible for highway maintenance, and no similar maintenance problem exists in water or air transport. About 27 percent of railroad employees are engaged in maintenance of equipment and stores, predominantly skilled men. Train-and-engine-service employees comprise about 22 percent of the railroad labor force. Clerical forces constitute 16 percent; station and communications employees about 12 percent of the total, and supervisory, professional, and miscellaneous employees make up the rest.

In water transportation, shore employees, consisting of clerical, freight handling forces, and some maintenance employees, comprise about 70 percent of the total. Occupations on shipboard, consisting of licensed and unlicensed personnel, comprise 30 percent of the total. Of the shore employees about three-fourths are longshoremen and freight handlers, the largest single occupation, and about one-fourth clerical and office, maintenance, and miscellaneous employees. The maintenance force employed in water transportation is relatively small, since major repair jobs on ships are usually performed by independent companies. Considerable longshore work is also performed by independent operators.

In motor trucking, about 74 percent of all employees are drivers and drivers' helpers; 6 percent garage and other maintenance employees, and 20 percent terminal and office employees.[7] In bus transportation, about 55 percent are drivers and drivers' helpers; 24 percent maintenance, and 21 percent station and office employees. In truck transportation, especially, occupational specialization has not been carried as far as in other branches of transportation where the average size of operating concerns is much larger. There are thousands of owner-drivers in truck transportation who perform most of the essential occupational functions themselves. Many owner-drivers, as well as the smaller trucking concerns, rely on commercial garages for maintenance.

In air transportation, flight personnel constitute about 15 percent of all employees. Mechanics and ground-crew employees constitute about 25 percent of the total, other hangar and field personnel 19 percent, while the remaining 41 percent consist of clerical and office, traffic, and administrative employees.

Of the labor force of pipe-line companies the operating force, comprising about 37 percent of the total, is employed at pumping stations. Dispatchers and telegraph operators are also required at pumping stations to control oil movements. Repair and maintenance men comprise about 30 percent of the total. Clerical and office forces are the principal remaining groups, except that when new lines are being constructed, large numbers of engineers, specialized mechanics, helpers, and laborers are employed.[8]

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[6] *Fluctuations in Railway Freight Traffic Compared with Production*, Interstate Commerce Commission, Statement No. 4030, July 1940.

[7] *Property Motor Carrier Industry*, August 1941, Wage and Hour Division, U. S. Dept. of Labor.

[8] For a more detailed description of the transportation labor force, see *Comparative Labor Standards in Transportation*, Federal Coordinator of Transportation, 1937, ch. II, and the following industry reports also issued by the Federal Coordinator of Transportation: *Hours, Wages, and Working Conditions in Scheduled Air Transportation*, March 1936; *Hours, Wages, and Working Conditions in Domestic Water Transportation* (vols. I and II), September 1936; *Hours, Wages, and Working Conditions in the Intercity Motor Transport Industries*, part I, October 1936; part II, November 1936; part III, December 1936.

Hours and Wages in the Transportation Industry

The transportation industry is particularly conscious of the problem of differing wage and hour schedules in its several branches as a result of the intense competition for traffic which has accompanied the growth of motor, air, and pipe-line transportation. An appraisal of these differences is important to an understanding of the transportation labor problem. In 1937 the Federal Coordinator of Transportation issued a comprehensive survey of comparative labor standards in the industry which related to the period 1933–35. A similar study for more recent years is not available. It will prove useful, however, starting with a summarization of the wage and hour comparisons as found by the Coordinator, to show the more important changes that have occurred during the last several years.

Hours of Work

Any attempt to compare wage rates in the various transport agencies by use of averages or other measures is difficult because of the differences that exist in the occupational composition of the labor forces. Comparisons of hours of work, however, particularly scheduled hours, are more valid. Hours of work are influenced far less than wage rates by occupational differences, and average hours of work are, therefore, more apt to reflect actual differences in standards than variations among the branches of transportation in the kinds of labor required.

According to the Coordinator's report, the pipe-line industry in 1934 had established the shortest workweek of any section of the transportation industry since it operated on a scheduled 36-hour week for most employees in that year. The 48-hour week was generally accepted as standard in the railroad industry and was common, though far from general, in air and motor transport. Except for pipe lines, each branch of the transportation industry, including the railroads, employed groups of workers whose workweek exceeded 48 hours. From 10 to 12 percent of all railroad employees were found to work regularly more than 48 hours per week, including 3 percent scheduled for more than 56 hours per week.[9] Substantially all vessel personnel in water transportation worked on a more than 48-hour week basis in 1933. Deck and engine room employees in the offshore and Great Lakes trades were scheduled for 56 hours or more per week, while the 12-hour day was common in the steward's department. Many river, bay, and sound operations were conducted on a 12-hour day basis.[10]

In July 1933 it was found that 51 percent of the employees of the bus companies surveyed worked 52 hours per week or over, 24 percent worked 60 hours and over, and 4 percent worked 72 hours and over. Forty-seven percent of the truck employees for whom data were obtained for the same month worked 52 hours per week and over, 27 percent 60 hours and over, and 5 percent 72 hours and over. For air transportation 44 percent of ground personnel were found to work 50 hours per week or more, but less than 1 percent 60 hours or more.

The Coordinator's report summarized its conclusions as to hours worked as follows:

> The foregoing evidence indicates that there are substantial differences in the extent of long hours in the several forms of transportation. It also indicates that standardization of hours within the occupations of a single industry has been carried furthest in rail and pipe-line transportation, but that it is also quite general in water transportation. However, differences in hours worked within an individual establishment, or in one branch of transportation compared with another, do not always measure competitive difficulties to the same degree as do differences in hourly earnings. Long hours paid for at what competitors would regard as reasonable hourly rates are not in themselves a handicap to competitors, except as they enable faster or more flexible service. This influence is largely confined to motor and air transportation, as delivery time by vessel, rail, or pipe line ordinarily would not be affected by a change in individual employees' hours. In air transportation the requirements of safety dictate relatively short periods of continuous duty. Where, however, transportation is conducted on a long-hours' basis and a change would eliminate the carriers observing such hours from business, a kind of competition is present which other carriers find it difficult to meet. Conditions of this kind are most apparent in parts of the trucking industry and in certain sections of water transportation. The requirements of public safety and of employee welfare are, of course, other important considerations in connection with the hours worked in transportation.[11]

In those sections of the transportation industry where hours were long in 1933 and 1934 a good deal of change in the direction of shorter hours has taken place since that time. Data included in some of the Federal Coordinator's labor reports for the year 1935 showed that hours of work had declined between 1933 and 1935. Since railroads were already operating generally on a 48-hour week these changes have occurred for the most part in other transportation agencies. In the bus and truck industry the 48-hour week is becoming standard for bus and truck drivers. The Department of Labor found that in 1939 the union scale of hours in motor-truck transportation averaged 47.8

[9] *The extent of Low Wages and Long Hours in the Railroad Industry*. Federal Coordinator of Transportation, November 1936.

[10] *Hours, Wages, and Working Conditions in Domestic Water Transportation*, vol. I, ch. II.

[11] *Comparative Labor Standards in Transportation*, p. xii.

hours per week for drivers and 47.1 hours per week for drivers' helpers.[12]

On the high seas and on the Great Lakes the 8-hour, 3-watch day is now practically universal. Under the La Follette Seamen's Act, as amended June 1936, all seamen, licensed officers, and sailors, as well as coal passers, firemen, oilers, and water tenders, while at sea, operate a 3-watch. No licensed officer or seaman in the deck or engine department may be required to work more than 8 hours in one day except in certain emergencies.

On the inland waterways, on the rivers and harbors, on towboats, tugs, ferries, and barges, the 8-hour day prevails only on the Pacific coast. Elsewhere throughout the country 12 hours constitute the work day where a 2-watch crew is engaged and 13 hours or even more where only a single crew is engaged. Where such vessels are subject to Government inspection, it has been ruled that 13 hours of continuous work are the maximum allowable under the requirements of health and safety.

Since 1934 longshoremen on the Pacific coast have had a 6-hour day as part of a collective agreement established by a decision of the Federal Board which mediated the strike of that year. On the Atlantic coast and in the Gulf the 8-hour day is the rule.

These changes have eliminated to an important degree the long-hour schedules that existed in 1933–34, bringing hours standards in water transportation and bus and truck transportation much closer to the standards prevailing in the railroad industry than was true 6 and 7 years ago. In air transportation, short hours have always prevailed for flight personnel. Collective agreements limit flying hours to 85 a month and generally provide for an 8-hour day, 6-day week for ground personnel.

The widespread acceptance of the 8-hour day in the transportation industry has removed many questions as to scheduled hours of work from employer-employee controversy. This acceptance has come more recently in water, bus and truck, and air transportation than in the railroad industry, and it is by no means complete even in the latter. At the same time, it can be said that there is general agreement in the transportation industry on the desirability of the 8-hour day, while in pipe-line transportation, and among longshoremen and air pilots, even shorter work schedules have been agreed upon.

Labor Cost Ratios

Comparisons of the ratios of labor costs to operating expenses (including wages), or to operating revenues, indicate the relative importance of labor costs to each branch of the transportation industry, but reveal little as to existing differences in wage standards. In 1939 salaries and wages as a percent of operating revenue were:

44.1 for Class I line-haul railways.
39.4 for air transportation.
37.9 for carriers by water.
36.3 for motortruck transportation.
29.3 for motorbus transportation.
18.6 for pipe-line transportation.

When taxes and depreciation are included in operating costs, the percentage of pay-roll cost becomes:

53.8 for Class I line-haul railways.
40.7 for air transportation.
39.0 for carriers by water.
38.2 for motor-truck transportation.
35.2 for motor-bus transportation.
31.7 for pipe-line transportation.

These figures show that wage costs as a percent of total costs are relatively greater on railroads than on other transport agencies, and greater for carriers by water and air than by bus and truck and pipe line. The relation of labor cost to other cost factors is, of course, influenced by variations in wage standards, but it is not possible to measure these variations from the ratios themselves.

Wage Rates and Earnings

Any comparison of wage rates and earnings in different industries must be made with caution. It is difficult to find adequate statistics on which to base comparisons and it is even more difficult to be certain that other considerations do not destroy the relevance of comparisons that existing data seem to make possible. Differences in occupational composition invalidate many comparisons of rates of pay as between transport agencies, either because of the difficulty of comparing unlike occupations or because the proportion of employees in like occupations is not the same. Average annual earnings by industrial groups are likewise so affected by occupational differences and, in addition, by differences in the amount of annual employment as to be relatively useless as an indicator of high or low wage standards.

In the Federal Coordinator's study of *Comparative Labor Standards in Transportation* an attempt has been made to show the relation between wage standards in the various agencies of transportation in 1933–35, emphasizing the misleading character of comparisons based on averages for all employees in each branch of transportation. This study showed that the highest

[12] *Union Wages, Hours, and Working Conditions of Motortruck Drivers*, June 1, 1939, Bulletin No. 676, Bureau of Labor Statistics, United States Department of Labor, p. 3.

average hourly earnings for all employees existed in air transport, and that average hourly earnings for all employees in pipe-line and bus transport were higher than in railroad and truck transportation. It pointed out, however, that:

> An industry whose high average hourly earnings are explained by its requiring a large proportion of skilled or highly skilled employees is not necessarily observing better standards than one with a lower average, where this average represents the compensation of a preponderantly lower grade of work. As has been noted, the high hourly earnings of airline pilots do not necessarily establish that industry as one which observes high standards; on the other hand, the relatively low average hourly earnings of railroad employees as a group afford no adequate picture of the general wage standards observed by the railroads. In particular, the necessity these carriers are under of maintaining their own rights-of-way calls for the employment of very large numbers of relatively unskilled and low paid employees. The compensation such employees receive appreciably reduces the averages for the railroad industry.[13]

Some occupational comparisons were made, but it was emphasized that differences in skills and responsibilities prevented very definite conclusions. Differences were found in the average hourly compensation of rail and automobile mechanics, however, that were too great to be accounted for by occupational dissimilarities. It was concluded that the wage standards of mechanics tended to be higher on the railroads than in motor transport. Railroad clerks were also found to be relatively higher paid than clerks in other branches of transportation.

Rather extensive comparison was made in the Coordinator's report of average hourly rates of laborers, since differences in these rates are much less influenced by occupational requirements than are the rates of employees of higher skills. It was found that pipe-line laborers were more highly paid than laborers in any other branch of transportation. For the rest of the transportation industry average hourly earnings for laborers did not differ materially from one branch of transportation to another. There were, however, substantial proportions of laborers receiving relatively low earnings in all branches of transportation, except pipe lines.

Although it is difficult to compare the earnings of unlicensed seamen in water transportation with the earnings of any group of employees in other branches, the Coordinator's report showed that, making allowance for subsistence and quarters, unlicensed seamen averaged from 38 cents to 40 cents an hour in 1934. This rate was sufficiently low to warrant the conclusion that workers in other branches of transportation in occupations which required reasonably equal experience and training were substantially higher paid.

[13] *Comparative Labor Standards in Transportation*, p. 96.

In all branches of transportation, except pipe line, there were areas of relatively low wages which were larger in bus and truck transportation and in water transportation than in the railroad industry. One of the most significant findings of the Coordinator's study related to these areas of low wages. According to the report, "the range of earnings of employees in a given occupation in a single branch of transportation is appreciable and almost always greater than the difference in average rates paid for like work in two or more fields of transportation."[14] This was particularly true in common labor occupations and was most marked among employees where union organization was relatively weak. The greatest amount of wage uniformity among like employees was found in the railroad and pipe-line industries, while the greatest lack of uniformity was found in bus and truck transportation, particularly the latter. These conclusions of the Coordinator's report indicate that wage rate competition is often more intense within a single branch of transportation than between two branches and that wage competition between individual concerns in any one form of transport or between the various parts of the transportation industry tends to disappear as union organization increases in strength and effectiveness.

Wage Rates Since 1933–34

Wage rates have increased in the transportation industry since 1934, particularly in those sections of the industry where wages were relatively low. As a result, differences in wage standards among the several agencies of transportation tended to be narrower in 1940 and 1941 than in 1934. General increases have also been obtained in some branches of the industry. This tendency toward a greater uniformity in wage standards will be clear from a survey of recent wage changes, beginning with the railroad industry.

In 1934, the 10-percent deduction which was made effective for railroad employees in 1932 was restored by agreement: 2½ percent effective July 1, 1934; 2½ percent January 1, 1935; and the remaining 5 percent on April 1, 1935. In 1937, the railroad unions asked for a general increase in wage rates and obtained, through mediation, increases which averaged 7½ percent to 8 percent for all employees. Business improvements in the early part of 1937 which prompted the increases did not continue and in the fall of 1937 the railroads began negotiations with the unions for wage decreases. Negotiations were unsuccessful and in May 1938 the railroads served notice of a decision to reduce wages by 15 percent. The ensuing controversy followed the processes laid down by the Railway Labor Act and

[14] *Ibid.*, p. xii.

was eventually placed in the hands of an Emergency Board appointed by the President which concluded in October of 1938 that no horizontal reduction on a Nation-wide scale should be made at that time.[15]

The passage of the Fair Labor Standards Act, which provided certain minimum standards for industry generally, resulted in increased wage rates in certain sections of the railroad industry where wages had been relatively low. Effective March 1, 1941, a minimum wage order was issued under that act setting 36 cents an hour as the standard minimum for employees of Class I railroads and 33 cents an hour for employees working on short lines.[16] It is estimated that about 70,000 railroad workers have had their hourly earnings increased by that order. The largest single group affected was section men in the maintenance of way services.[17]

Employees in water transportation have made important wage gains since 1934, through both a shortening of hours and an increase in rates. These changes have been largely associated with the growth of union organization and union contracts. In March 1936 the $5-per-month differential which existed between Atlantic, Gulf, and Pacific coast deep-sea personnel was eliminated. The basic monthly rate for able seamen at the beginning of 1936 was $62.50 per month; for ordinary seamen, $45; for oilers, $72.50; and for firemen, $62.50. Basic rates for seamen employed on tankers, on ships in the Pacific-Alaska trade, and on Pacific steam schooners were from $12.50 to $15.00 per month higher. A $10-a-month increase in rates was obtained on both coasts in 1937 and 1938, another $10 increase in 1940, and a further $7.50 increase in 1941. The rate for able seamen early in 1941 was $90 per month, for ordinary seamen $72.50, for firemen $90 and $92.50, and for oilers $100. For comparative purposes the value of maintenance and quarters at from $30 to $36 per month should be added to basic rates. The National Maritime Union estimates that the two increases obtained in the 8 months ending in February 1941 represent at least a 25 percent gain in the average wages paid aboard ship.[18] Licensed personnel have likewise received increases, though the percentage increases have been smaller. No other branch of the transportation industry has experienced comparable increases in a similar recent period.

By an agreement in December 1940, effective February 1941, union rates for longshoring on the Pacific coast were increased from the basic rates fixed by the longshoremen's award of October 12, 1934, at 95 cents an hour straight time and $1.40 an hour overtime to $1 and $1.50, respectively. On the North-Atlantic Coast the corresponding hourly wages for longshoremen are 25 cents higher. But there the basic work-day, before overtime rates begin, is 8 hours, whereas on the Pacific Coast it is 6 hours. For ports below Norfolk, Virginia, the rates are lower. For example, in Mobile, Alabama, the basic rate is 75 cents an hour; in Savannah, Georgia, the rate ranges between 50 and 60 cents an hour; in Jacksonville, Florida, it ranges between 45 and 50 cents an hour. On the Gulf Coast the basic hourly rate begins at $1 an hour. All these rates apply to deep-sea service. For handling coastwise freight the rates are about 20 percent less. On the Pacific Coast there are no differentials between deep-sea and coastwise service wage rates.

Motor-truck drivers' and helpers' wages have been increasing with the extention of new union agreements. Comparable averages for earlier years are not available for helpers, but for drivers the following averages of union rates have obtained since 1934.[19]

1934	$0.70
1935	.73
1936	.73
1937	.77
1938	.79
1939	.79
1940	.81

This upward change of the hourly rate of wages for motor-truck drivers is seen also in the increase in the percent of drivers working under union contracts who receive wages of $1 or more an hour, from less than 5 percent before 1937 to over 14 percent in 1938 and 1939.

A 40-cent hourly minimum wage for employees engaged in motor-bus and motor-truck transportation was recommended by the two industries committees to the Administrator of the Wage and Hour Division in September 1941. If an award is issued on the basis of these recommendations wages will be raised for some 4,000 of the 36,000 employees in the motor-bus industry and for over 70,000 of the estimated 600,000 employees in the motor-truck industry.[20] These low-wage employees are engaged principally in clerical and terminal work.

Data as to average pay rates and earnings of employees in air transport are scattered and incomplete, but such data as exist indicate that wage standards

[15] *Report of the Emergency Board to the President*, appointed September 27, 1938, under section 10 of the Railway Labor Act, U. S. Government Printing Office, Washington, D. C., 1938.

[16] *Wage Order: Minimum Wage Rates in the Railroad Carrier Industry*, Effective March 1, 1941, Wage and Hour Division, U. S. Dept. of Labor.

[17] *Railway Age*, January 4, 1941, pp. 123–124.

[18] *The Pilot*, February 14, 1941, p. 6. It should also be noted that additional emergency compensation of from $30 to $40 per month is paid for service in certain war-risk areas.

[19] United States Department of Labor, Bureau of Labor Statistics: *Union Wages, Hours, and Working Conditions of Motor-truck Drivers*, for given years.

[20] Press Release No. 1563, dated September 4, and Press Release No. 1567, dated September 12, 1941, Wage and Hour Division, U. S. Dept. of Labor.

in the industry have considerably increased since 1934. According to the Civil Aeronautics Board the average monthly rate for pilots, who are the highest paid employees in the transportation industry except top executives, increased from $524 per month in 1934 to $678 per month in 1938. Copilots' monthly wage rates increased from $201 per month in 1934 to $237 in 1938.[21] Recent agreements covering copilots provide for entrance rates of $200 per month, increasing to $375 per month after 6 years of service.

No data on the average wages of ground personnel are available which can be compared with the information obtained by the Federal Coordinator of Transportation for 1933. However, the rapid growth in the number of union agreements covering certain occupations indicates an increase in average wages. For example, in the agreement of January 1, 1940, between the Air Line Mechanics Association, International, and The American Airlines, Inc., hourly rates for apprentices were set at 42 to 65 cents compared with a range of 38 to 44 cents effective August 1935; hourly rates of mechanics were set at 80 cents compared with a range of 45 to 53 cents in 1935; of senior mechanics they were set at 90 cents compared with a range of 57 to 65 cents in the earlier year; and of master mechanics at a $1.00 as against 69 to 72 cents in 1935. In 1935 overtime was paid at 1⅓ normal rates. In 1940 it was paid at 1½ normal rates. On the Pennsylvania-Central Airlines, the basic pay of crew chiefs (mechanics) has been raised from $175 a month for 1937, the year for which statements were first filed by this company with the National Mediation Board, to $210 a month in an agreement to run from November 1, 1939, to December 31, 1941. Inspectors' pay was raised from $175 a month to $200, and Mechanics' pay from $150 a month to a scale running from $164 to $194 a month.

As indicated earlier, average compensation in pipe line transport generally runs higher than in any other branch of transportation. Detailed wage-rate data by occupation are not available to show wage changes since 1934. Interstate Commerce Commission statistics of annual earnings, however, show that on an annual basis average compensation of pipe-line transportation employees has risen from $1,557 in 1934 to $1,973 in 1940, or 40 percent.[22] A substantial portion of this increase represents upward adjustments of wage rates.

The foregoing data indicate that such wage disparities as existed among the various branches of the transportation industry in 1933–34 are much less at the present time. Wage rates in pipe-line transportation are still higher than in other transport agencies. In water transportation, in the unionized portions of the bus and truck industry and among certain classes of ground personnel of air lines, wage rates have increased faster than in the railroad industry. The statutory minima established by the Fair Labor Standards Act and the order issued under that act applying to the railroads have eliminated certain areas of relatively low wages in the transportation industry. The recommendations of the bus and truck industry committees, if approved, will further restrict these areas of low wages.

Wage Payment Rules in the Railroad Industry

A wage problem exists in the railroad industry which arises out of the interpretation of certain wage payment rules and which has assumed sufficient importance to merit special consideration. The problem was referred to in the report of Emergency Board appointed by the President to investigate the railroad wage dispute of 1938. According to this report:

> * * * Consideration of savings in labor costs could also focus upon certain problems that should engage the attention of management and men more openly than has hitherto been the case. These flow from regulations prevalent in the operating service that call for pay not commensurate with the amount of additional benefit rendered. Some of these regulations have been relaxed or dropped, but a frank, candid inquiry as to their equitable nature could well be made the obligation of both management and men.[23]

The Emergency Board was calling attention principally to certain rules in train and engine service which provide extra pay for employees in one class of service who perform incidental work in another class of service and which have been the subject of a good many decisions by the National Railroad Adjustment Board. While the bulk of these decisions have concerned train and engine service employees, the principles which they have established have been increasingly invoked by other crafts.

Two examples of such "double pay" taken from decisions of the National Railroad Adjustment Board are given in the briefs and testimony submitted by the railroads to the Attorney General's Committee on Administrative Procedure in 1940.[24] The two cases are as cited in a statement by the carriers to this Committee:

> A local freight crew was required to stop at a point intermediate to the beginning and end of its run, set out three cars from its train, and pick up three cars to go forward in its train, and to move certain cars standing on a Standard Oil Co. siding in order that they might be unloaded. There was no switch

[21] *Civil Aeronautics Journal*, Civil Aeronautics Authority, October 15, 1940, p. 455.

[22] Interstate Commerce Commission, Bureau of Statistics: *Statistics of Oil Pipe Line Companies*, 1940. Statement No. 4133, table 1.

[23] *Report of the Emergency Board to the President, op. cit.*, p. 56.

[24] See *Inquiry of the Attorney General's Committee on Administrative Procedure Relating to the National Railroad Adjustment Board*, compiled by Harry E. Jones, executive secretary, Eastern Committee for the National Railroad Adjustment Board.

engine crew on duty at the time at this point. For this service at the Standard Oil plant this conductor and crew of the local freight train each claimed pay at yard rates. An extra yard foreman and an extra switchman who were not on duty and performed no service whatever also claimed a day's pay each on account of not having been used to perform this work. The work performed at the Standard Oil Co. plant required 15 minutes. Although this was the kind of work generally required of local freight crews and the kind of work for which they received a rate of pay, which is higher than the rate paid to crews not required to perform this kind of work, the Board granted the claim of the local freight crew and also awarded to the two extra men who performed no service whatever a day's pay for not having been used to do this work. (First Division, Award No. 1947.)

A regularly assigned fireman made a round trip of 50 miles. On the first leg of the trip the train carried only passenger cars and at the turning point the crew was required to back its passenger equipment to a point where the engine was turned and given necessary attention by the enginehouse forces. Returning the train carried only freight cars back to its starting point. The Board held that the fireman was entitled to 3 days' pay—a day in passenger service for the passenger run from the initial terminal to the turning point, a day as hostler for taking the engine to the enginehouse, and a day in local freight service for taking the train back to the starting point. (First Division, Award 3751).[25]

These cases illustrate payments that arise because of the separation required by the rules governing the various classes of employees. Wage payments of this sort are opposed by the carriers on the grounds that they result in costs for which the railroads derive no benefit, that neither the rules nor justice to employees require such payments, and that attempts to avoid them constitute severe handicaps to efficiency of operations. The carriers maintain that rules as to starting time have similarly resulted in payments for time not worked since emergency changes in the starting time for a given work day have resulted in claims for more than 1 day's pay even though work has been performed for 8 hours or less.

At the hearings at which the cases cited above were presented in evidence, representatives of the Railway Labor Executives' Association defended the principles on which the National Railroad Adjustment Board had based its decisions concerning "double pay," but observed that in matters so complex it was not so surprising that the carriers had found decisions to criticize, as that they had not found more of them.[26]

A representative of the Brotherhood of Railroad Trainmen addressed himself somewhat more directly to the carriers' attack upon the substance of these Adjustment Board decisions and pointed out that the only "double pay" involved was in reality a penalty payment to employees whose seniority rights to perform a given class of work had been impaired. The following is quoted from his testimony:

Generally speaking, the classes I represent, particularly yard and roadmen's rights to service, are separate and distinct. There is a limit around the yards that separates their rights and within which yardmen may perform all the work and outside of which the roadmen perform the work. Therefore, when the roadman comes in and interferes with the seniority rights of the yardman by being required to do some of that work, he claims that as an additional day. Why? Because he has fulfilled his 100 miles or less in road service and because he has been injected into yard service, where the agreement provides that 8 hours or less will constitute a day. If the carrier does not work him 8 hours, that is their own business. And the yardman makes a claim because his seniority right to the service guaranteed under his contract has been impaired, and he wants pay for that. In that instance you might call it penalty pay. Not so with the roadman that does the work, because he has done all that the carrier has asked of him, whether it be 1 hour or 8 hours, and the rule says 8 hours or less constitutes a day. So that is not penalty pay; that is paying a man for service, which has been contracted for. And the recourse of the carrier, if they find a condition that requires attention—and the contract is rather binding—it is not to arbitrarily disregard the provisions of the contract; it is to call the attention to the representatives of the employees and in a fair manner point out the particular spot and ask for negotiations for relief.[27]

It seems clear from an examination of Adjustment Board decisions involving "double pay" that some of them, even though they may be logical deductions from the rules, work hardship and injustice on the carriers. This is particularly true in cases where the money awards seem out of proportion to any damages that may have been suffered by the employees concerned from alleged violation of rules. Cases in which back pay is claimed for a period of several years before protest against the alleged violation of the rules is made are of this type. An impartial study of the whole question is urgently needed because of the bad effect on labor relations which will undoubtedly result from a continuation of the present controversy. Such a study might well be undertaken by a joint committee of representatives of carriers and employees. If it is true that in certain situations the rules produce inequitable results, the obvious remedy is for the parties concerned to reach agreement as to desired changes. Likewise, if certain rules are being interpreted to mean something else than was originally intended by them they can be changed by negotiation so as to alter the ambiguous language which made such interpretations possible. The rules in question have been arrived at by a process of negotiation and agreement. They can be changed or amended by the same process. It should

[25] *Ibid.*, p. 282.

[26] These representatives, however, took the position that the Attorney General's Committee was concerned with a review, not of the decisions of the National Railroad Adjustment Board, but of its procedure and that procedural changes would not of themselves produce changes in the Board's decisions.

[27] *Ibid.*, pp. 324–325.

be pointed out, however, that both parties to these agreements are reluctant to open them up for change as to any given question because of the possibility that demands for changes as to many other points will be made.

The problem just discussed has been frequently, but mistakenly, linked with an item of wage payments to train and engine service employees which has often been erroneously described as "time paid for but not worked." The Commission does not use the concept "time paid for but not worked" in its statistics of train and engine service compensation, because of its misleading character. Nevertheless, the impression still persists that the amounts in question represent millions of dollars for which no service is performed.

The "dual basis" of wage payment in road, train, and engine service results in a payment per mile or per hour depending upon the hours worked and the average speed of the train. For example, a conductor in road freight service is entitled to receive wages under the applicable rules based on hours if his average speed is less than 12½ miles per hour and based on miles if his average speed exceeds 12½ miles per hour and his run is more than 100 miles. For this class of service and for pay purposes 100 miles is the equivalent of 8 hours of work.[28] Under the agreement rules the conductor is entitled to pay for 8 hours or 100 miles even though he works less than 8 hours or makes less than 100 miles.

If the conductor makes more than 100 miles at an average speed of 12½ miles per hour or more he is paid at a rate in cents per mile for each mile run. If he makes 200 miles in 8 hours he receives twice as much as for 100 miles and he is credited in Interstate Commerce Commission statistics with receiving 16 hours of pay for 8 hours of work. If the "speed basis" were raised from 12½ miles to 25 miles per hour the extra 8 hours would disappear, yet the conductor would be performing exactly the same work for exactly the same pay as before. In other words, there is no meaning in saying that the conductor under these circumstances gets paid for "time not worked."

In 1936 this subject was carefully examined.[29] So-called "time paid for but not worked" amounted to more than 15 percent of the train and engine service pay roll in 1934 or to a total of $66,000,000. According to that report:

> Three-fourths of the amount in question was paid for service rendered in miles of transportation run during straight-time hours at speeds faster than the "speed basis" adopted as a standard for the purpose of determining a day's pay. Money so earned cannot fairly be considered as payment for time not worked. It is a payment for service rendered and is proportionate thereto. It has grown because the employees' mileage output per hour has increased and their return in wages has therefore increased also.[30]

The remaining one quarter of payments for "time paid for but not worked" in train and engine service was found to arise principally from the system of daily and monthly guarantees. A train and engine service employee gets a day's pay if he reports for duty at all. This daily pay is considerably less than pay for a normal day of work because the "standard" day on which it is based represents pay for only 150 miles for conductors and trainmen in passenger service and only 100 miles for all other road train and engine service employees.[31] In yard service the daily pay is based on the rate for 8 hours. A restricted number of train and engine service employees, principally conductors and trainmen on regularly assigned runs, are guaranteed pay for each working day in the month, providing they are ready and available for service each day. Railroad officials have not expressed any general opposition to these guarantees except when other rules have prevented them from transferring work from employees in one class of service to employees in another, or when "starting time" rules have produced disputes as to when one day ended and another began.

The explanation given above should make clear that so-called "time paid for but not worked" as derived from the wage statistics of the Interstate Commerce Commission is unrelated to the compensation paid under rules which may permit 2 or more days' pay for a single day's work or may permit compensation when no service has been performed at all, even of a "stand-by" character. Payments of the former type are for the most part dependent upon work performed and constitute an essential feature of the present method of determining wages in train and engine service.

Addendum on Recent Wage Changes

This report was completed just as the influence of America's defense program began to be felt in the wage structure of American industry. In some respects, therefore, the report is not wholly up-to-date. It may prove useful to record some of the recent wage changes in the railroad and water transportation industries, even though it is too soon as yet to appraise their significance.

In the railroad industry, the economic changes result-

[28] In passenger service (except commuter service) 100 miles or 5 hours constitutes the basic day for engineers and firemen and 150 miles or 7½ hours for conductors and trainmen.

[29] *A Survey of the Rules Governing Wage Payments in Railroad, Train, and Engine Service*, vols. I and II, Federal Coordinator of Transportation, March 1936.

[30] *Ibid.*, vol. 1, p. 8–6.

[31] This discussion does not apply to commuter service where special rules are in effect.

ing from transition to a war economy led to a movement for wage increases initiated by the unions in June 1941. At about the same time the railroads requested important changes in labor-agreement rules. The ensuing controversy followed the negotiation and mediation procedures laid down by the Railway Labor Act but no settlement was reached. The question of vacations with pay for non-operating employees had been raised a year earlier but had not been settled.

On September 10 an Emergency Board was appointed by the President to consider the various matters in dispute, as required by the Railway Labor Act, and hearings were held in Chicago in September and October. On November 5 the Board recommended wage increases of 7½ percent for employees represented by the five operating brotherhoods and 9 cents an hour, or an increase of about 13½ percent, for employees represented by the 14 non-operating organizations.[32] These increases were recommended as temporary, to expire automatically December 31, 1942, unless extended by agreement. A week's vacation with pay was recommended for non-operating employees with one year's service in the industry. An increase of 7½ cents per hour was recommended for employees of the Railway Express Agency. Finally, the Emergency Board recommended basic minimum hourly rates of 40 cents for employees of the short-line railroads and 45 cents for all other railroad employees. Except for the 40-cent minimum, no other increase was recommended for short-line railroad employees. It was suggested that some increase for these employees was warranted but should be obtained through negotiation between the employees and employers concerned.

The railroad labor organization refused to accept these recommendations and threatened to strike if further increases were not granted. The President reconvened the Emergency Board on November 27, to consider the problem created by the unwillingness of the employees to accept the Board's recommendations. On December 5 the Board announced that while it adhered to its original recommendations, its members had acted as mediators in effecting a settlement involving further increases.[33]

According to the terms of the mediation agreement, operating employees are to receive an increase of 9½ cents an hour in basic rates and non-operating employees, 10 cents per hour. These represent permanent increases. In addition to the week's vacation with pay for non-operating employees, clerks and telegraphers with two years' service will receive 3 days' vacation, or a total of 9 days, and those with 3 years' service, 6 days, or a total of 12. Both employees and management agreed to a moratorium on rules changes for the duration of the emergency. Retroactive pay based on the Emergency Board recommendations of November 5, 1941, will date from September 1, and the additional increases based on the mediation agreement, from December 1.

A wage increase of 10 cents an hour for Railway Express Agency employees was included in the mediation agreement which the Agency at first refused to accept but later agreed to. The mediation settlement did not provide for any wage increases for employees of the short lines other than the minimum hourly rate recommended in the Emergency Board's first report.

In October 1941 the National Maritime Union negotiated a new agreement with shipowners which increased both basic and emergency rates.[34] Under the new agreement the basic monthly rate for able seamen is $82.50; for ordinary seamen, $65.00; for oilers and water tenders, $92.50. The monthly wages for other ratings among unlicensed personnel, except in the steward's department of passenger vessels, were increased in about the same proportions. To these basic rates are added $10.00 per month emergency wages for ships in the coastwise trade, $12.50 per month for those trading to the Dominican Republic, and $17.50 per month for the offshore trades, except in the steward's department of passenger vessels, where the additional emergency wage is $12.50 per month.

The overtime rate in the new agreement was fixed at 70 cents per hour as the basic rate, plus a temporary increase of 15 cents, or a total overtime rate of 85 cents per hour.

Union Organization in the Transportation Industry

That collective bargaining, accepted by both parties and upheld by labor contracts, is fundamental to good employer-employee relationships is more widely recognized in the United States today than in any previous period. The right to collective bargaining has been part of the law of the land for railroad workers for many years and for workers in most other industries since 1935 when the National Labor Relations Act was passed. In 1936 air-transport workers were covered by the guarantees of the Railway Labor Act. Past experience has demonstrated that there can be no enduring labor peace in any section of the transportation industry where the right to collective bargaining is denied.

In order to make the right to collective bargaining

[32] *Report to the President by the Emergency Board*, appointed September 10, 1941, under Section 10 of the Railway Labor Act, 1941.

[33] *Supplementary Report to the President by the Emergency Board*, appointed September 10, 1941, under Section 10 of the Railway Labor Act.

[34] *The Pilot*, November 7, 1941, section 2, p. 1.

effective it is necessary that the organization to represent employees be determined by the employees themselves; that written agreement as to hours, wages, and working conditions be made, and that adequate and effective machinery be created, first for negotiating grievances arising out of the interpretation of agreements, and secondly, for settling disputes over the making of new agreements or the modifying of old ones.

There is less disparity today in the extent and effectiveness of collective bargaining among the several transportation agencies than was true seven and eight years ago. In 1933–35, the years covered in the Report of the Federal Coordinator of Transportation on comparative labor standards, only the railroad industry, of the several transport agencies, could be said to have satisfied the requirements for effective collective bargaining. That industry had had much more extensive experience with methods of dealing with the problems of labor relations than had any other branch of transportation. Furthermore, machinery for securing the maximum effectiveness of negotiations between employer and employee had been more completely established in the railroad industry than among its principal competitors.

Since 1933–35 rapid progress in trade-union organization has greatly advanced the processes of collective bargaining in the transportation industry. Railway organizations have continued to gain strength, but the greatest changes have occurred in other branches of transportation. Union membership in the maritime industry more than trebled between 1935 and 1940. In air transport, as late as 1936, there was only one effective labor organization, the Air Line Pilots' Association, with 600 members. As of 1940, from 20 to 30 percent of the more than 14,000 employees in the industry were operating under trade-union agreements. In bus and truck transportation, from 60 to 70 percent of the employees are covered by trade-union agreements as compared with a much smaller but unknown percentage 5 years previously. Among carriers by pipe line, trade unionism has developed less than in other branches of transportation. It is estimated that only between 10 and 20 percent of pipe-line employees are working under labor agreements.[35]

Labor Organization in the Railroad Industry

The first railroad trade union, the Grand International Brotherhood of Locomotive Engineers, was organized in 1863. In the 20 years following, three other major brotherhoods were organized, the Order of Railway Conductors in 1868, the Brotherhood of Locomotive Firemen and Enginemen in 1873, and the Brotherhood of Railroad Trainmen in 1883. These three, together with the Brotherhood of Locomotive Engineers, are the "Big Four" of the railroad labor organizations and were the mainstay of the trade-union movement in the railroad industry throughout its formative stages. During the 1880's most of the craft unions which, at the time of organization or at a later date, included railroad shop employees in their membership were organized. The Brotherhood of Maintenance of Way Employees and the Order of Railroad Telegraphers were organized during the same period. In 1898 the Brotherhood of Railway and Steamship Clerks, Freight Handlers, Express and Station Employees was organized, now the largest of the railroad trade unions in terms of railroad employee membership.

The increasing strength of railroad unions was recognized and encouraged by Congress in 1926 with the passage of the Railway Labor Act, which guaranteed to railroad employees the "right to organize and to bargain collectively through representatives of their own choosing" and placed a duty upon employees and employers to make and maintain agreements. It is estimated that at the beginning of 1941 more than 90 percent of all railroad employees in train and engine service, maintenance of way, clerical and station forces, and shop crafts were covered by trade-union agreements.[36]

Railroad workers, generally, are organized on a craft basis and in local, divisional, or system-wide negotiation are represented on that basis. Among the shop-craft unions, agreements with individual carriers are usually negotiated by system federations representing all the shop crafts organized on the particular carrier. In 1926 the separate craft unions formed a joint organization known as the Railway Labor Executives' Association. This organization now includes 20 unions (since the Brotherhood of Railroad Trainmen resigned in 1937), of which several have a large membership outside of the railroad industry. Through the Railway Labor Executives' Association the separate craft unions act as a single body on matters which are of common interest to all of them.

The 21 unions which originally formed the Railway Labor Executives' Association are known as the "standard" railroad labor unions. Of these, 14, representing principally the shop crafts, the clerks, maintenance-of-way employees, and marine employees, are affiliated with the American Federation of Labor. The 7 A. F. of L. unions representing the shop crafts—the blacksmiths, boilermakers, sheetmetal workers, machinists, carmen, electrical workers, and firemen and oilers are

[35] Estimates of the present-day coverage of labor agreements in the various branches of transportation are those of the Bureau of Labor Statistics, U. S. Dept. of Labor.

[36] *Ibid.*

united in the Railway Employees' Department, established in 1908. The train service brotherhoods, known as the "Big Four," the American Train Dispatchers' Association, and the Brotherhood of Railroad Signalmen are independent unions. The National Marine Engineers' Beneficial Association is affiliated with the Congress of Industrial Organizations.

Water Transport

With few exceptions, the present unions in the water transportation industry are of relatively recent origin. There were collective agreements in effect in the industry on the West Coast prior to the first World War, but there was little recognition of unions elsewhere. During the War there was a rapid expansion of trade unionism but conditions in the post-war period were decidedly adverse to seamen's unions and by 1929 their World War gains had largely disappeared.

As in so many other industries, passage of the National Industrial Recovery Act in 1933 provided strong impetus to the revival of trade-union organization among maritime workers. A period of bitter strikes followed which, in spite of the collective agreements obtained in 1934 and 1935, continued until 1936 when the industry on both coasts was in large part strike-bound for a period of several weeks. In the meantime, the National Labor Relations Act of 1935 had been passed with its important guarantees to workers of the rights to organize and to bargain collectively through representatives of their own choosing. Conditions aboard ship were somewhat improved by amendments to the Seamen's Act in 1936. Labor relations in the industry, however, continued to be unsatisfactory and in 1937 the Maritime Commission, which had been newly created by the Merchant Marine Act of 1936, reported that employer-employee relations constituted one of the most difficult problems facing the American merchant marine. According to the Commission:

> [The shipping industry was] paying for its shortsightedness in repressing labor for so many years. Some of the operators who paid low wages during the depression were at the same time receiving substantial subsidies from the Government for the preservation of an American standard of living. By denying their employees the right to organize, shipowners created a condition favorable to un-American doctrine. For 11 years owners refused even to answer requests of their workers for collective agreements. When the seamen finally did organize and forced the owners to hear their demands, these demands were naturally distorted by the repressions of the preceding years.[37]

Great impetus to trade-union organization in water transportation was given by the organizational drives on the Pacific Coast in 1934–35. The total membership of all trade unions existing in water transportation in 1935–36 has been estimated at 84,200[38] or less than one-third of the 259,000 workers employed in water transportation at that time. Since then, a series of agreements have been obtained which, by the beginning of 1941, had brought a majority of the larger companies engaged in water transportation to an acceptance of collective bargaining. The trade-union membership of marine workers as reported by the Maritime Labor Board, which represents conditions in 1939, adds up to over 261,000, or to nearly 81 percent of a total estimated water-transport employee population of 300,000. The Department of Labor estimates that, as of March 1941, 75 to 85 percent of all deep-sea vessel personnel, excluding tanker personnel and 80 to 90 percent of all longshoremen were working under the terms of labor contracts.

There is a sharp division on board ship between licensed and unlicensed personnel which has been reflected to some extent in trade-union organization and activities. The National Organization of Masters, Mates, and Pilots of America represents deck licensed officers, while the National Marine Engineers' Beneficial Association represents licensed officers in the engine department. The United Licensed Officers of the United States of America have membership in both the deck and engine departments.

The unlicensed personnel and longshoremen are sharply divided along lines of trade-union affiliation. The majority of seamen on the Atlantic and Gulf Coasts and an increasing percentage on the Great Lakes, the Marine Cooks' and Stewards' Association of the Pacific Coast, and the International Longshoremen's and Warehousemen's Union on the Pacific Coast are C. I. O. affiliates. A majority of the Pacific Coast seamen and the International Longshoremen's Association covering chiefly Atlantic and Gulf ports are A. F. of L. unions. The Pacific Coast Marine Firemen, Oilers, Watertenders and Wipers' Association is affiliated with neither the C. I. O. nor the A. F. of L.

Air Transport

Trade-union organization in air transportation is as new as the industry itself. At the present time, from 30 to 40 percent of the employees are working under labor contracts, most of them pilots and mechanics. Other classes of personnel are relatively unorganized, partly because the number of employees is small and scattered with few in a given class at any one point, partly because they include "white collar" classes who have been traditionally hard to organize, and partly

[37] *Economic Survey of the American Merchant Marine*, United States Maritime Commission, November 10, 1937, pp. 46–47.

[38] Estelle M. Stewart, *Handbook of American Trade Unions*, Bulletin No. 618, United States Department of Labor, Bureau of Labor Statistics, 1936.

because no great effort has been made to organize air-line employees apart from pilots and mechanics. Air lines and their employees became subject to the Railway Labor Act in 1936 and in each of its annual reports since that time the National Mediation Board has reported continued growth in the number of labor agreements in this industry. In the fiscal year 1939, 18 new agreements were negotiated, making 34 in effect as of June 30, 1939. As of June 30, 1940, there were 44 labor agreements in effect covering air-line employees. As of June 1940, aviation mechanics had collective agreements with 17 out of the 27 scheduled air-line carriers filing agreements with the National Mediation Board. In the Spring of 1941 all but one or two of the scheduled air-line carriers were operating under trade-union agreements with the Air Line Pilots Association.

Employees in the air-transport industry are largely organized on a craft basis. Separate unions exist for pilots and copilots, radio operators, and mechanics. Pilots and copilots are represented by the Air Line Pilots Association International, an A. F. of L. affiliate. Mechanics are represented by the A. F. of L. International Association of Machinists and by the Air Line Mechanics Association International, an independent union limited to the aviation industry. There are a few system associations among all classes of air line employees except pilots.

Motor Transport

The Federal Coordinator reported that, while truck employees were better organized than bus employees in 1935, only a small proportion of workers engaged in motor transport were then covered by labor agreements. Since that time progress in union organization has been rapid until at the present time it is estimated by the Department of Labor that 60 percent or more of the employees in city and intercity trucking and in intercity bus transportation are working under labor contracts. As in other branches of the transportation industry where union organization was not strong the passage of the National Labor Relations Act has played an important part in obtaining increased recognition of the principle of collective bargaining.

The majority of organized union truck drivers are represented by the International Brotherhood of Teamsters, Chauffeurs, Stablemen and Helpers of America, affiliated with the A. F. of L. Certain of the C. I. O. industrial unions include truck drivers in their membership. The A. F. of L. International Union of United Brewery, Flour, Cereal, and Soft Drink Workers of America, which until recently has claimed jurisdiction over motor-truck drivers employed in the industries which it represents, has been ordered by Court to relinquish that jurisdiction to the Teamsters' Union.[39] Other important unions representing motor transport employees are the Amalgamated Street and Electric Railway and Motor Coach Employees, the International Association of Machinists and the Brotherhood of Railroad Trainmen. There are some system associations, particularly among employees of bus companies owned or partially owned by railroads.

Pipe-Line Transport

It is estimated that 10 to 20 percent of employees in pipe-line transportation are working under labor agreements. Union organization has never been strong in this branch of transportation, partly because of the high labor standards which have prevailed, independently of union activity, and partly because of jurisdictional difficulties. The majority of the organized employees in the industry are members of the International Association of Oil Field, Gas Well and Refinery Workers. There are more than 20 other unions who claim jurisdiction over various groups of employees in the petroleum industry.

The Establishment and Maintenance of Labor Standards

Throughout the greater part of the transportation industry, standards of hours, wages and working conditions are now established and maintained by agreement between workers and management through the processes of collective bargaining. Such a development has been possible because both employers and employees have recognized a common interest in settling their differences through negotiation and compromise. While this acceptance of collective bargaining has eliminated certain causes of labor disputes, an equally important result has been the resolution of disputes through orderly and peaceful means.

Collective bargaining is a continuing process that begins with union organization, union recognition, and the negotiation of written agreements. These agreements establish rights and impose duties upon both parties. Their provisions may be misunderstood or they may be violated. Therefore, there must be some continuing means of interpreting and of enforcing them. Either party may wish to change the existing standards and rules set up in the labor contracts. Therefore, both parties must stand ready to resume negotiations when the demand for such changes is made or, in those cases where agreements are made for limited periods, when the life of the existing agreement has expired.

The machinery for interpreting and enforcing labor agreements is usually set up in the agreements themselves, except as the establishment of such machinery

[39] *William Green, et al. v. Joseph Obergfell, et al.*, 121 F. (2d) 46 (App. D. C. 1941).

by law makes their inclusion in agreements unnecessary. In the transportation industry, many agreements provide for joint committees to whom disputes arising out of the contracts are referred in the event that they are not settled through the ordinary negotiation arrangements. The work of these committees may be somewhat informal in character or may extend to a more formal consideration in which a neutral outside party is called in to cast the deciding vote. Procedure of this sort has been developed most extensively in water and motor transport but is largely absent from the railroad industry because procedures under the Railway Labor Act have supplanted it. In the air-transport industry, adjustment boards are established in the agreements themselves but in accordance with the terms of the Railway Labor Act.

The settlement of disputes arising out of labor contracts may also be carried out through machinery established by law. Such means exist in elaborate form for rail transportation in the Railway Labor Act while voluntary arrangements in air transport are largely influenced by the requirements of that Act. To a less important extent, procedures established by law for the settlement of disputes exist for the rest of the transportation industry, as well as for other industries, in the mediation and conciliation services provided by the Department of Labor.

The Railroad Industry

The railroad industry in recent years has been more successful than any other great American industry in establishing and maintaining labor standards by peaceful means. It is also true that Federal law has gone further in setting up procedures for handling labor relations on railroads than in any other industry. At the same time it must be remembered that most of the work of collective bargaining, even in the railroad industry, is carried on by direct negotiation without the intervention of third parties. Governmental machinery is utilized only when direct negotiation has failed to accomplish its purpose.

The Railway Labor Act of 1926, as amended in 1934, requires the railroads and their employees to exert every reasonable effort to make and maintain agreements, prohibits employers from interfering with their employees' rights to organize and establishes adjustment and mediation procedures for the settlement of those disputes which have not yielded to direct negotiation. The law sets up two Boards to administer its provisions, the National Mediation Board and the National Railroad Adjustment Board.[40]

The National Mediation Board mediates disputes arising from differences between carriers and employees regarding changes in rates of pay, rules or working conditions, and supervises the conduct of elections for the purpose of determining employee representation. Either party to a dispute may ask for mediation; or the Board may offer its services. If mediation fails, voluntary arbitration may be resorted to under the Board's supervision. If arbitration fails or is not desired, and an emergency exists, the President may appoint a special fact finding committee to hold hearings, take testimony and make a report. While the recommendations of such an emergency board are not binding, they are usually accepted by the parties to the dispute. Strikes are not expressly forbidden by the Railway Labor Act, but it is the intent of the law to discourage them until all the procedures provided for settling disputes have been exhausted.

The Railway Labor Act provides that disputes arising out of the interpretation or application of agreements "shall be handled in the usual manner up to and including the chief operating officer of the carrier designated to handle such disputes." If this direct negotiation does not produce a settlement, the law provides that the dispute shall be referred to the National Railroad Adjustment Board. This Board functions through four divisions, each concerned with a specified group of occupations.[41] A given division of the Board is composed of an equal number of representatives of workers and of management, appointed by the corresponding parties and compensated by them. If a division of the Board cannot agree and becomes deadlocked, a neutral referee is called in who casts the deciding vote. The neutral referee is selected by the members of a division of the Adjustment Board or, if no referee can be agreed upon, by the National Mediation Board.

The work of the National Mediation Board is generally approved by employers and employees alike. The work of the National Railroad Adjustment Board has been the subject of considerable controversy. Most of the complaints come from employers. They maintain that divisions of the Adjustment Board are too often deadlocked, that neutral referees frequently prefer a literal interpretation of the provisions of an agreement over an interpretation based upon the customs of the industry, and that the whole process is very costly to the railroads.[42] Employees, on the other hand, maintain that the decisions to which employers object are logical deductions from the rules and are arrived at through procedures which insure impartial-

[40] For a discussion of the origin and work of the National Mediation Board see *The Railway Labor Act and the National Mediation Board*, published by the Board in August 1940.

[41] For a factual study of the work of the Board see *The National Railroad Adjustment Board*, William H. Spencer, 1938.

[42] See Julius H. Parmelee, *The Modern Railway*, 1940, pp. 428–429.

ity. They point out further that costs resulting from adjustment board decisions would be decreased if employers prevented violations of the rules, and that, in any event, the way is open to change existing rules by negotiation.

The area of disagreement between employers and employees on these questions is so wide that no third party can safely attempt to appraise the situation without a great deal more study than has been possible for purposes of this report. It will be pertinent in this connection, however, to review the findings of the Attorney General's Committee on Administrative Procedure which relate to the National Railroad Adjustment Board. Extensive briefs were submitted to this Committee as to the Board's procedures and several hearings held on the Adjustment Board in which evidence was presented by representatives of both men and management.[43] A final report covering many Federal agencies and including recommendations was released by the Committee to the Attorney General on January 22, 1941.[44]

In the opinion of the Attorney General's Committee part of the procedural difficulties which the Railroad Adjustment Board encounters arises from the fact that its members represent the parties to the controversies which it is called upon to decide. The Committee discussed the probable advantages of a disinterested tribunal over a bi-partisan board, but did not feel prepared to recommend that a change be made. It concluded, however, that a "nonpartisan agency, if it could be brought into being by agreement among the various interests affected, would prove to be an instrumentality superior to the one now maintained by the carriers and the employee organization."[45]

It can hardly be denied that a nonpartisan agency might be free of some of the handicaps of the present bi-partisan board "if it could be brought into being by agreement among the various interests." This would only mean that railroad labor and management themselves felt that a nonpartisan agency would be superior to the present form. But it is quite unlikely that such agreement could be reached. The difficulties which the Attorney General's Committee emphasized in its discussion of the composition of the Adjustment Board are chiefly encountered in Division I dealing with train and engine service. It is noteworthy that the members of Division I have almost never agreed on the appointment of a neutral referee while, for example, the members of Division II dealing with shop craft employees almost always agree. This fact might have suggested to the Attorney General's Committee that the question of the composition of the Adjustment Board was a relatively superficial one. There is an unresolved conflict between train and engine service unions and railroad management as to the interpretation of certain agreement rules. If a solution could be found to that conflict either a bi-partisan or a nonpartisan adjustment board might be satisfactory to both parties. Until the conflict is resolved neither kind of a board can be satisfactory to them.

The Attorney General's Committee noted that there was not at present any statutory limitation upon the time within which a claim could be brought before the Adjustment Board and recommended that the Railway Labor Act be amended to require that a claim filed later than one year following the event out of which it arose should not be recognized.[46] There is a certain essential justice in this recommendation which is widely recognized in the railroad industry. It is not likely that such a change would be seriously opposed by railroad employees.

At the present time when disputes are submitted to any of the four divisions of the Adjustment Board, submissions detailing their respective positions are filed simultaneously by the employee organization and by the carrier. These disputes are negotiated in the first instance by union and management representatives on the property. By the time appeal is made to the Adjustment Board both parties can be expected to be reasonably familiar with the issues raised. The Attorney General's Committee observed that the railroads felt themselves aggrieved by this procedure and that it prevented a "sharpening of the controverted issues and the possibility of narrowing their scope." It, therefore, recommended that claimants be required to make a submission in the first instance and that opportunity be given to respondents thereafter to examine the submission and make a reply to it. Though this recom-

[43] For a study of this information prepared by a member of the investigating staff of the Attorney General's Committee and submitted to that committee, see *Railway Labor, The National Railroad Adjustment Board, and the National Mediation Board*, Monograph No. 17, The Attorney General's Committee on Administrative Procedure, as revised in April 1940. For the principal documents relating to the inquiry see *Inquiry of the Attorney General's Committee on Administrative Procedure Relating to the National Railroad Adjustment Board*, compiled by Harry E. Jones, Executive Secretary, Eastern Committee for the National Railroad Adjustment Board.

[44] *Final Report of the Attorney General's Committee on Administrative Procedure*, Government Printing Office, Washington, D. C., 1941.

[45] *Administrative Procedure in Government Agencies*, S. Doc. No. 8, 77th Cong., 1st sess., 1941, p. 186.

[46] *Ibid.*, p. 186. Lloyd K. Garrison, who has acted as referee in many deadlocked cases, has made this and some otber of the recommendations which appear in that part of the report of the Attorney General's Committee dealing with the National Railroad Adjustment Board. See "Labor Relations in the Railroad Industry," an address delivered by Mr. Garrison before the Academy of Political Science, November 12, 1936, and "The National Railroad Adjustment Board, a Unique Administrative Agency," also by Mr. Garrison, both published in *Inquiry of the Attorney General's Committee on Administrative Procedure Relating to the National Railroad Adjustment Board*, compiled by Harry E. Jones.

mendation is not of major importance, it is possible that its adoption would result in more good than harm. At the same time it should be pointed out that the Adjustment Board is not at present encumbered with any great amount of legalistic formalities. If the change were made with a view to involving the Board in legal technicalities it would rightly be viewed with suspicion.

Adjustment Board procedure requires that, when a case has been deadlocked through the evenly divided vote of the members of a given division, a neutral referee be called in whose opinion finally decides the issue raised. The Attorney General's Committee found that not all divisions of the Adjustment Board followed the same practice with respect to permitting interested parties to file briefs with and address oral arguments to the referee. In the case of Division I, which deals with train and engine service cases and has a larger volume of cases to handle than any other division, neither arguments nor briefs addressed to the referee are permitted. The Committee noted that where this permission had been granted, it has not been used to any great extent. Nevertheless, it recommended that the privilege of submitting briefs or addressing oral argument to the referees be accorded by each of the divisions of the Adjustment Board, since little difficulty would be caused by granting this privilege and since carriers feel that an important source of their dissatisfaction with the operation of the Adjustment Board would thus be removed.

One of the most serious immediate problems faced by the Adjustment Board is the large number of cases pending in Division I, the train and engine service division. The Committee noted that the Railway Labor Act permits a division to empower two or more of its members to conduct hearings and make findings upon disputes, provided that final awards are made by the entire division. It, therefore, recommended that this procedure be followed by Division I in order to eliminate long delays and the large backlog of undecided cases.

Whether these recommendations, if adopted, would eliminate the objections raised by railroads to the National Railroad Adjustment Board is somewhat questionable. As their testimony before the Attorney General's Committee showed, the carriers are primarily interested in the substance of the Board's decisions, rather than in the procedure by which these decisions are reached. Some of the problems raised by the substantive character of agreement rules and Adjustment Board decisions concerning them have been previously discussed. It also has been emphasized previously that there is a fundamental conflict in regard to the interpretation of some agreement rules which goes deeper than mere procedure. Until that conflict is resolved the Adjustment Board will continue to be in difficulties even though its procedures should be improved. Past experience indicates that there is sufficient economic statesmanship in the industry to find a solution for this problem if the main points of issue are reviewed by men and management in the cooperative spirit upon which the success of collective bargaining depends.

Air Transport

Employers and employees in the air transport industry were brought under the Railway Labor Act in 1936, even though the majority of employees were not organized in trade-unions. The number of collective-bargaining agreements has increased since 1936, particularly among pilots and mechanics, and the use of negotiation as a means of settling disputes has been correspondingly extended. Even now, however, more than half of the employees in the industry are not organized.

When direct negotiation fails to settle disputes between air transport employees and their employers as to the application of agreement provisions, an adjustment procedure is utilized which differs markedly from that established by the Railway Labor Act for the railroad industry. The act does not require a National Adjustment Board for air transportation, but instead permits system adjustment boards to be established by agreement between the air carriers and their employees. These adjustment boards are generally provided for in agreements covering pilots and to some extent in agreements covering mechanics. The Railway Labor Act also provides for the creation of a National Air Transportation Adjustment Board if, in the opinion of the National Mediation Board, such establishment seems necessary.

The National Mediation Board has the same jurisdiction over disputes involving changes in rates of pay, rules, or working conditions as in the railroad industry and also supervises the conduct of elections to determine union representation. Both employees and employers have increasingly used the union election and mediation machinery of the act and in general are favorably disposed to work for its successful operation. Between 1936 and 1941 there was only one instance in which disputes were not amicably settled by the parties concerned or with the help of the National Mediation Board. It is the opinion of the Board that "On the whole * * * the relative stability prevailing in the air line labor relations is due in no small measure to the fact that the air lines and their employees are subject to the provisions of the Railway Labor Act and that most of the air-line operators and the represent-

atives of their employees are guided by the provisions of the act in the development and maintenance of their labor relations."[47]

Water Transport

The most important parts of existing machinery for the adjustment of disputes between maritime employers and employees are found in the labor contracts. Maritime agreements are in sharp contrast to agreements in the rail transportation industry in this respect In maritime labor agreements the means of settling grievances, or of disputes regarding the provisions of agreements, are usually spelled out in elaborate form. Almost all of these agreements for employees on shipboard and more than three-fourths of the longshore agreements provide for the arbitration of disputes arising under the agreements. Joint committees representing labor and management are established by many of the agreements for settling grievances in the first instance. When these committees cannot agree, the agreements frequently provide for the selection of an impartial chairman who acts with the joint committee as a kind of arbitration board. Some agreements on both the Atlantic and Pacific coasts provide for an arbitrator or for an arbitration board which is set up for the period during which the agreement is in force. These arbitration boards are usually bi-partisan in character with a provision for the selection of an impartial chairman. Usually this impartial chairman is selected by the other members of the Board. Some agreements provide that, in the event of failure to select such a chairman, various Government officials or agencies, such as the Secretary of Labor, the Director of Conciliation of the United States Department of Labor, the Maritime Labor Board, or the National Labor Relations Board, may be called upon to select the impartial chairman. Almost all maritime agreements prohibit strikes and lock-outs during the period in which the agreement is in effect.[48]

Some maritime agreements permit questions of wage rates to arise during the life of the agreement and establish arbitration as a means of settling disputes as to those rates. Most of them make negotiation obligatory after notice has been given by either party of intent to terminate an existing agreement.

Workers in water transportation are covered by a special Federal law, Title X of the Merchant Marine Act of 1936, for purposes of adjusting disputes which are not settled by the parties themselves. The law was enacted as a temporary measure in hope that it would be followed by more adequate legislation. Until June 23, 1941, when an amended act was approved, the Maritime Labor Board had power to mediate disputes when requested by either party or upon its own initiative. If mediation failed the Board could suggest arbitration, but had no power to appoint arbitration boards. There was no requirement that the procedures of the act be utilized in the course of a labor-management dispute. While the Railway Labor Act places a duty upon employers to exert every effort to make and maintain agreements, Title X of the Merchant Marine Act placed a duty upon the Maritime Labor Board, which administers its provisions, to encourage employers to exert every effort to make and maintain agreements. The supervision of elections to determine representation is not a function of the Maritime Labor Board. This function is exercised for water transport employees by the National Labor Relations Board under the National Labor Relations Act.

In March of 1940 the Maritime Labor Board submitted a report to the President and Congress in accordance with the requirement of the Merchant Marine Act that the Board report on a plan for the "establishment of a permanent Federal policy for the amicable adjustment of all disputes between maritime employers and employees and for the stabilization of maritime labor relations."[49] This report frankly recognized the weakness of the law and recommended that it be strengthened in important respects, particularly by placing a duty upon the industry to make and maintain agreements, rather than a duty upon the Board to encourage the industry to do so.

The Board was unable to secure agreement within the industry on any permanent plan for the peaceful settlement of disputes. According to the report: "The Board does not assume that its recommendations constitute a final, full-grown plan designed to inaugurate an era of perfect harmony between maritime employers and employees. In a democratic country, orderly and amicable employer-employee relationships in any industry are predicated upon the gradual growth of mutual respect and understanding, which in the maritime industry are still in the formative stage."

Until its mediation functions were abolished in June 1941, the Maritime Labor Board shared them with the Conciliation Service of the Department of Labor. Employers or unions in the industry could call upon either agency to mediate a particular dispute. A good many employers, and the unions affiliated with the American Federation of Labor, relied upon the Conciliation Service of the Department of Labor. A smaller number

[47] *The Railway Labor Act and the National Mediation Board, op. cit.*, p. 39.

[48] See "Strike Restrictions in Union Agreements," *Monthly Labor Review*, U. S. Department of Labor, March 1941, pp. 557, 558.

[49] Maritime Labor Board, *Report to the President and Congress*, March 1, 1940, p. XI.

of employers, and the unions affiliated with the Congress of Industrial Organizations, used the services of the Maritime Labor Board. This competition of mediation services made it difficult for the Maritime Labor Board to be as effective an influence in the industry as it might otherwise have been.

The water transportation industry has made considerable progress toward more satisfactory labor relations since the report of the Maritime Labor Board of March 1940. Hearings on a bill to extend the life of the Board held in the early part of 1941 developed a good deal of controversy as to the part the Board has played in this improvement.[50] The House Committee was favorably impressed with the work of the Board and voted in favor of a bill to extend its life for an additional two years. The Senate, however, amended the House Bill by extending the Board for one year only, by depriving the Board of its mediation functions, and by placing a positive duty on employers and employees to make and maintain agreements. With these latter amendments the bill was approved by the President on June 23, 1941.

In the hearings on the bill, representatives of employers and A. F. of L. maritime unions favored discontinuance of the Maritime Labor Board, while representatives of C. I. O. unions urged that its life be extended.

The controversy over the bill suggests that it is a mistake for Congress to authorize two Federal agencies to provide mediation services for the same industry. All parties were agreed on the value of mediation and upon the desirability of providing Federal mediatory services on a voluntary basis. It is not conducive, however, to the satisfactory performance of such mediation functions as are exercised by Government agencies to permit a kind of competition to develop between two of them. While this competition was resolved for the maritime industry in favor of the Conciliation Service of the Department of Labor, the fact that the Maritime Labor Board was continued indicates either that no final solution of the problem has been reached or that the Maritime Labor Board has been given a reprieve which will not prevent its final abolition.

The nature of a more permanent solution of the problem of the extent to which government should intervene in maritime labor relations rests largely with employers and employees in the industry itself. If major employer-employee disputes are settled without serious disputes damaging to the public interest, there is no necessity for supplementing existing machinery. If the existing machinery for the settlement of disputes fails to achieve reasonable industrial peace, it must give way to more effective procedures.

Motor Transport

In motor transportation, as in the maritime industry, the more important provisions for settling disputes are found in union agreements. Direct negotiation is the means utilized in the first instance, although in a great many of the agreements this process of direct negotiation is implied by the very existence of the agreement rather than spelled out in detail.

The largest class of organized employees in motor transportation is that of truck drivers. In many of the agreements covering truck drivers it is provided that grievances shall first be reviewed by an individual or committee designated by the union to represent employees in the handling of grievances. If this individual or committee is unable to negotiate a settlement, the business agent of the local union handles the negotiation. In many other agreements the business agent conducts the negotiation of a given grievance in the first instance.

Almost all the agreements applicable to truck drivers provide that disputes which have not been settled by direct negotiation shall be referred to arbitration. As in water transportation, the arbitration board is a bipartisan body with an equal number of representatives selected by the union and by the employer. These representatives in turn select an impartial chairman. Some of the labor contracts provide that if an agreement cannot be reached as to selection of an impartial chairman, an outside agency, such as the United States Conciliation Service or the National Labor Relations Board, shall be asked to designate the impartial chairman. Some of the agreements provide that the arbitration board or committee shall first attempt to settle the dispute and that the impartial chairman will be designated only when the arbitration board or committee is unable to effect settlement. In a few agreements which have been negotiated with large employers or with employers' associations and which in consequence cover large numbers of employees, provision is made for the establishment of permanent joint committees to which all unsettled disputes arising during the life of the agreement are referred. These committees become arbitration boards with the designation of an impartial chairman for the consideration of disputes which the committee by itself has been unable to adjust. Most agreements forbid strikes and lockouts

[50] See *Hearings on H. R. 4107, An Act To Extend for Two Years Provisions of Title X of the Merchant Marine Act, 1936, As Amended*, before a Subcommittee of the Committee on Commerce, U. S. Senate, 77th Cong., 1st Sess., May 13 and 14, 1941, and before the Committee on Merchant Marine and Fisheries, House of Representatives, same session, on the same bill, March 13 and 20, 1941.

until the methods of settling disputes as set up by the agreements have been exhausted.[51]

Agreements in the motor transport industry and in water and pipe-line transportation, like labor agreements generally, do not set up any means of arbitrating disputes resulting from the negotiation of new agreements, or from changing the terms of old ones. At the same time, either the agreements provide that such disputes shall be negotiated in the first instance upon notice of either party of a desire to change the existing agreement, or it is generally understood that such negotiation will take place. In the event of failure to reach a settlement, either party can call upon the Conciliation Service of the United States Department of Labor to mediate the dispute.

The National Labor Relations Act

Employees and employers in the transportation industry, except for railroad and air transportation employees covered by the Railway Labor Act, are subject to the terms of the National Labor Relations Act. The fundamental purpose of this act was to secure the establishment of collective bargaining, to prevent certain unfair labor practices which tend to discourage the development of collective bargaining, and to ensure that this collective bargaining would be carried out in good faith. The act does not of itself establish machinery for the settlement of disputes. At the same time it has an extremely important function in both the prevention and settlement of disputes. The act is primarily concerned with the establishing of those conditions of collective bargaining which are essential if disputes between employers and employees are to be resolved by negotiation. To the extent that the act is successful in securing the establishment of collective bargaining, the question of the recognition of unions by employers is removed from the area of dispute. Furthermore, to the extent that the act is successful in requiring written agreements as an evidence of intent to bargain in good faith, methods of settling disputes by negotiation are developed as an indirect result of the enforcement of the act's provisions. It is only in the most immature of written agreements that some means or other of settling disputes as to the application of the agreement are not provided for.

The National Labor Relations Board does not have any mediation or arbitration functions. The Board is sometimes designated, however, in the terms of labor agreements as the agency for the selection of an impartial chairman of an arbitration board.

[51] See *Union Wages, Hours, and Working Conditions of Motor-truck Drivers*, Bulletin No. 676, Bureau of Labor Statistics, U. S. Department of Labor, 1940, pp. 16–17; and "Strike Restrictions in Union Agreements," *op. cit.*, pp. 563–564.

Problems of Economic Insecurity

The development of measures for protecting workers against insecurity has been a major contribution of the past 10 years to the economic progress of the United States. In the railroad industry these measures have produced notable instances of labor-management cooperation which have demonstrated that the right to security can be a subject of common interest rather than of grievance and dispute.

There are five major protections which have been developed to a greater or less extent in almost every branch of the transportation industry: (1) protection in the right to hold a job, (2) protection against the wage losses of unemployment, (3) protection from the results of industrial accidents, (4) protection from the wage losses of ill health, and (5) protection against insecurity in old age. Some of these have been started on a voluntary basis by employers and employees. The most important have come about through the enactment of State and Federal legislation. For a long time to come there will be disagreement as to the exact means of attaining these objectives. But there is increasingly less disagreement as to the right of every worker to be protected from major economic insecurities as a fair return, in addition to his wages, for his contribution to production.

Protection in the Right to Hold a Job

The idea that a worker has a properety right in his job if he fulfills his obligations to it has developed unequally among the several branches of the transportation industry. It is strongest where labor organizations and labor contracts are most effective and where they have had the longest history. Protection in the right to a job is incorporated in rules of agreements which provide that promotion, lay-offs, and the filling of vacancies shall be determined by an employee's seniority or length of service as compared with the seniority of other employees in the same occupation at a given point or within a given area. This system has had its longest and most extensive development on the railroads where the working rules of the vast majority of employees contain seniority provisions.[52]

The seniority system has spread rapidly in recent years in motor and air transportation through the increase in the number of union agreements. Pipe-line agreements also contain seniority provisions, but the percentage of employees covered by agreements in this

[52] For a discussion of the origin and growth of the seniority system on the railroads see Dan H. Mater, "The Development and Operation of the Railroad Seniority System," *The Journal of Business of the University of Chicago*, October 1940, pp. 387–419, and January 1941, pp. 36–67. For a legal analysis of seniority as a property right see "Collective Bargaining Agreements: The Seniority Clause," *Columbia Law Review*, February 1941, pp. 304–317.

industry is still relatively small. Water transportation agreements do not ordinarily contain seniority provisions, in part because the nature of the industry makes seniority practices relatively inapplicable and in part because through hiring halls and otherwise, the unions maintain a large degree of control over the selection of personnel.

The seniority system is designed to limit the discretionary power of management in laying off, recalling, and promoting employees, in the interest of avoiding discrimination against union members, and of avoiding nepotism, personal favoritism, and even job selling. It also constitutes a method of securing and maintaining a reserve force of trained employees. Railroad officials in many instances have voluntarily recognized the principle of seniority for employees who are not working under labor agreements. It is probable that the seniority system will continue to be extended throughout the transportation industry as trade unionism grows and the collective bargaining process becomes even more firmly established.

Protection Against Unemployment

At the beginning of the depression unemployment insurance did not exist in the United States in the transportation industry or any other industry except for a few voluntary plans that were, for the most part, operated by trade unions. The passage of the Social Security Act in 1935 and the Railroad Unemployment Insurance Act in 1938 has resulted in the growth of an extensive system of unemployment insurance in an extremely short period of time in comparison to the time required for the development of older forms of social legislation, such as workmen's compensation.

At the present time almost all transportation employees, except seamen, are covered by unemployment insurance legislation. For workers in motor, air, street railway, and pipe-line transport, and for shore workers in water transport, unemployment insurance is established by State laws enacted in accordance with the standards set up in the Social Security Act. Benefits and conditions of eligibility, however, vary considerably from State to State. Maximum benefits range from about $64.50 per month in most States to about $77.50 per month in the four States, California, Idaho, Louisiana, and Wyoming, and in the District of Columbia. Minimum benefits vary from $21.50 per month in most States to $43 in California. The maximum duration of benefits ranges from 12 to 20 weeks in all but two States. In California the maximum is 26 weeks and in Wisconsin 34 weeks.

Unemployment insurance for railroad workers is provided under the Railroad Unemployment Insurance Act administered by the Railroad Retirement Board. The pay-roll tax levied upon employers to support the benefits is 3 percent—the same as the corresponding tax in Title IX of the Social Security Act. Subject to a waiting period, benefits are paid to eligible employees who have earned at least $150 in the base year for each day of unemployment in excess of four in a 14-day period and range from $1.75 to $4 per day. Weekly benefits for full-time unemployment that extends over periods of 2 weeks range from $8.75 to $20, depending upon the employees' base-year compensation. Benefits in any one benefit-year are limited to a maximum of 100 times the applicable daily benefit rate, so that the maximum duration of benefits in a single benefit-year, for total and continuous unemployment, is 21 weeks.[53]

It is to the common interest of employers in the transportation industry that employees should share, with reasonable equality, in the benefits of unemployment insurance, and no branch of the industry should receive a competitive cost advantage by reason of the absence of unemployment insurance legislation. This means that seamen should be included under some system of unemployment insurance, which seems possible only by Federal legislation, since the problems of conflicting jurisdiction seem insuperable otherwise. A bill establishing such a Federal system for seamen is now under consideration by Congress.

Consideration should also be given to extending unemployment insurance coverage to smaller employers under the Social Security Act and State laws. Many State laws have already been made applicable to employers with less than eight employees, in some cases to employers with one or more employees. About one-half still exclude employers with less than eight employees. The extension of the coverage of unemployment insurance legislation to small employers is particularly important in the case of motor carriers. The need of an unemployed truck driver is not related to the number of trucks his employer operates. Furthermore, fair competition requires that the obligation to provide for unemployment insurance be equally assumed by large and small employers.

The Railroad Unemployment Insurance Act arose in part from the difficulty of taking care of interstate workers by State administrative machinery. Similar difficulties exist for all interstate transportation workers. The problem should receive further consideration in the common interest of both employers and employees.

A special problem of unemployment has arisen from the various consolidation and coordination plans which

[53] This follows because the waiting-period requirement results in payment for only 7 days of unemployment in the first 2 weeks. Three days of benefits are therefore payable for the 21st week of total unemployment.

have been put forward in the railroad industry. The unemployment which results from the effective application of plans of this sort differs from unemployment arising from business recessions or seasonal changes because the particular jobs affected by consolidation and coordination are more apt to be permanently eliminated from the industry. More important, consolidation and coordination ordinarily result in an increased net income which makes possible a special form of compensation for resulting displacement of labor. This form of unemployment has given rise to consideration of programs of dismissal compensation.[54]

In any consideration of this subject it should be emphasized that employees prefer jobs to compensation for unemployment. Any form of dismissal compensation must, therefore, be regarded as a temporary measure for taking care of employees while they are attempting to establish themselves in new industries or occupations. Because workers preferred jobs to compensation without jobs, the Emergency Transportation Act of 1933 provided that railroad employees should be protected in the jobs they held as of May 1933. These protective features were, however, considerably less effective than either employers or employees anticipated.[55] When the Coordinator of Transportation, whose office was created by that act, was ready to issue orders requiring certain coordinations, the law, which had previously been extended, was allowed to lapse by Congress.

The protection afforded by the guarantee in the 1933 act, in the event that coordination plans should be carried out, became increasingly ineffective with the passage of time. In the spring of 1936 an agreement on a program of job protection was therefore negotiated between the Railway Labor Executives' Association, representing employees, and the Joint Conference Committee of Carriers, representing employers. Under the terms of the agreement employees displaced through the joint action of two or more carriers in consolidating facilities would receive allowances, based on prior earnings and length of service, up to a maximum of 5 years for employees with 15 or more years of service. While the benefits were liberal, the Federal Coordinator estimated that the savings from coordination plans would provide for them and still leave a substantial gain to employers.[56] In spite of the great amount of discussion of coordination and consolidation which has taken place, few programs have been undertaken which would result in invoking the terms of this agreement.

Large numbers of workers, however, have lost their jobs through the consolidation of operating properties and through coordination of operations of individual roads. The loss of employment through such intracompany consolidation and coordination was not made subject to the national agreement. But the fact that such an agreement was reached indicated that the provision of some form of compensation for this kind of unemployment, including unemployment arising from intracompany coordination, may fall within the field of common employer-employee interest.

The right of railroad employees to compensation for loss of employment in case of consolidation was given legal recognition anew in the provisions of the Transportation Act of 1940. This act provides that, in the case of consolidations or other forms of merger of operations of two or more carriers, the Commission "shall require a fair and equitable arrangement to protect the interests of the railroad employees affected" so that employees shall not be placed "in a worse position with respect to their employment."[57] This protection is to last for a period of 4 years from the date of the Commission's approval of such transaction or for a period equal to the length of service of the particular employee affected if less than 4 years.

On May 26, 1941, the Interstate Commerce Commission made a ruling in the first instance in which this protection was applied to employees. This was in the case of the acquisition of the Beaver Valley Railroad by the Pennsylvania, the Pittsburgh & Lake Erie, and the Cleveland & Pittsburgh. The Commission ruled that:

> Within 30 days * * * the carriers, by contract with each employee of the Beaver Valley Railroad Company, shall jointly guarantee each employee, for a period of not less than 4 years * * * monthly compensation equal to one-twelfth of the total compensation received by him in the 12 months immediately preceding April 17, 1941, the date of the filing of the application in this proceeding * * *: provided, however, that the protection herein afforded the employee shall cease prior to the expiration of the 4-year period in the event of his failure, without good cause, to accept a position with either carrier, the duties of which position he is qualified to perform, or in the event of his resignation, death, retirement on pension, or dismissal for good cause.[58]

No other group of transportation employees is so well protected against the effects of coordination and consolidation unemployment as railroad workers. The

[54] A detailed study of dismissal compensation plans used in this country and abroad will be found in Hawkins, Everett D.: *Dismissal Compensation*, Princeton University Press, Princeton, N. J., 1940. See especially pp. 157–175, dealing with dismissal compensation in the railroad industry.

[55] *Employment Attrition in the Railroad Industry*, Federal Coordinator of Transportation, January 1936.

[56] *Report of the Federal Coordinator of Transportation, 1934*, 74th Cong., 1st sess., H. Doc. No. 89, pp. 84, 99, and 152–168.

[57] The Interstate Commerce Act, Section 5 (2) (f).

[58] Cleveland & P. R. Co., Purchase, 244 I. C. C. 793. See also *Labor*, June 17, 1941, p. 4.

existence of measures of protection, however, has not abated the opposition of railroad labor organizations to coordination plans which might result in loss of jobs. This opposition has been frequently matched by the employer—an opposition which, for both management and labor, springs from a vested interest in existing economic relationships. Where either labor or management is able to demonstrate that coordination and consolidation plans cannot be expected to result in worthwhile economic and social savings, their opposition can both be understood and supported. On the other hand, in those instances in which it can be shown that worthwhile economic and social savings will result, the narrower interest of labor can not be allowed to stand in the way of long-range public interest and public policy.

Protection Against Industrial Accidents

The principle of workmen's compensation has been widely accepted as providing the best means of protecting employees from the losses resulting from industrial accidents. This has not been true of the transportation industry, however, where large numbers of employees are covered by employers' liability rather than workman's compensation procedure and where important groups of both employees and employers have been opposed to any change.

Accidents to interstate railroad workers and seamen are settled for under the terms of the Employers' Liability Act of 1908, which establishes the conditions under which suits for damages may be brought and is not a workmen's compensation law. Seamen were brought under this act in 1920, but may elect to sue for damages under admiralty law. Longshoremen and harbor workers are covered by a Federal Workmen's compensation law, the Longshoremen's and Harbor Workers' Compensation Act of 1927. All other transportation workers are covered by State workmen's compensation or employers' liability laws, although there have been instances of injuries to intrastate workers where no State would admit responsibility for providing compensation.

The result of all this has been an overlap and conflict of jurisdiction, and a dependence upon liability procedure for seamen and large groups of railroad workers which has been abandoned for most other industrial employees. Courts have had to spend a good deal of time in deciding such questions as whether a dockworker, knocked by a boom on shore to the deck of a ship, was injured on the dock or on the ship, since a State workmen's compensation law governed in the one case and the Longshoremen and Harbor Workers' Compensation Act in the other. More serious is the fact that under these procedures many interstate transportation workers may receive quite inadequate settlements or may be deprived of accident compensation altogether. The situation is so confused for bus and truck drivers, because of variations in State laws and court rulings, that State workmen's compensation administrators often cannot tell an employer what his obligations are. Suits for damages under liability procedure may bring larger benefits than would be awarded under statutory provision, in some instances, but legal fees often reduce the sum actually received by the injured worker or his survivors by a substantial percentage.

The Federal Coordinator of Transportation published a study in 1935 of the payments made in 1932 by all class I railroads on account of employee injury cases.[59] These carriers reported that 35,575 such cases were closed out in 1932. Of these, 16,876 were closed out without any money settlement. The remaining 18,699 cases cost the railroads $12,061,173 or $645 per case. The average becomes $339 per case if those settled without money payment are included.

It was estimated that nearly 80 percent of all railroad-employee injury cases came under the jurisdiction of the Federal Employers' Liability Act. Of the cases coming under Federal jurisdiction that result in payment to an injured employee or his heirs, more than 98 percent were settled out of court, so that the possibility of large awards from court judgments was limited to less than 2 percent of the cases coming under Federal jurisdiction in which payments were made to employees.

A comparison with workmen's compensation laws was made in the Coordinator's report for death cases only. It showed that, for nontrain deaths, the average payment made by the railroads was less than one-half of similar awards made under the Longshoremen's and Harbor Workers' Compensation Act or the District of Columbia Workmen's Compensation Act. For both train cases and nontrain cases the average payment was 71 to 78 percent of the average award under the Longshoremen's Act and 62 to 68 percent of the average under the District of Columbia Act. Deduction of legal fees would make these comparisons even more favorable to workmen's compensation procedure.

The Coordinator's report found little to commend in employers' liability procedure. The conclusions of the report on this point are quoted in full below:

> The statistics of accident costs presented in this report, however abstract they may appear when confined within the somewhat academic bounds of a statistical table, represent great disparities in the treatment of railway employees and their families who may be the victims of industrial accident. The few who are fortunate enough to be able to bring their cases to the attention of a sympathetic Federal jury, partic-

[59] *Cost of Railroad Employee Accidents, 1932*, S. Doc. No. 68, 74th. Cong., 1st sess.

ularly in the eastern States, may receive liberal awards, but only about 1.5 percent of all cases closed with payment were settled in this manner in 1932. At the same time it must be remembered that in this study the costs of litigation have not been subtracted in determining the average judgments awarded and paid. The report of the Sutherland Commission showed that these costs greatly lessen the net amount actually received by the injured employee or his survivors. Settlements out of court may also involve a lawyer's fee.

The great majority of railroad-employee cases are settled without recourse to the courts, and the payments made are often less than similar awards under adequate workmen's compensation laws. As a result, the railroad-accident compensation system takes on many of the aspects of a lottery, from which a few employees draw large sums but from which many receive insufficient awards. It is this inequity which constitutes the greatest indictment of the system and furnishes the most powerful argument in favor of a reasonable Federal workmen's compensation law.[60]

In September 1941 an Interdepartmental Committee, representing various Federal agencies interested in seamen's legislation, issued a comprehensive report on the subject of workmen's compensation for seamen.[61] The study was made under authority of a Senate Resolution, after hearings on a proposed workmen's compensation bill had developed the fact that, while management favored the bill, representatives of the seamen were against it. The investigation made by the Interdepartmental Committee was based, in large part, on a comparative study of recoveries under existing procedure and under various proposed plans of workmen's compensation. In the opinion of the committee, the study showed that, since sick and disabled seamen enjoyed certain advantages under Admiralty Law not available to industrial workers generally, any workmen's compensation law applicable to seamen "must incorporate certain features not typical of existing compensation statutes." Thus, the committee found that, using the scale of benefits of the Longshoremen's and Harbor Workers' Act as a basis of comparison, injured seamen as a group would receive more under the existing settlement system unless the proposed method of calculating benefits were liberalized. At the same time, the committee concluded that there was no question that workmen's compensation was superior to employer's liability as a means of settling for employee accidents in the Maritime Industry. The committee, therefore, recommended a plan which would not only secure the advantages of workmen's compensation procedure, but would result in higher total payments than the existing system. According to the committee's report:

The minimum standards of workmen's compensation for seamen should be a plan which (a) takes effect without waiting period upon determination of wages at the end of the voyage; (b) pays benefits during period of out-patient treatment and convalescence not less than the maintenance to which the injured seaman is entitled during a period of temporary disability; (c) provides benefits computed on a full-time wage base, together with value of subsistence and lodging and remuneration for overtime and bonuses; and (d) provides benefits at least equal to those provided under the Longshoremen's and Harbor Workers' Compensation Act, but without limitation of total benefits payable for death or disability. Such a plan would give the seamen fundamental protection superior to the recoveries available under the present system.[62]

Safety Programs and Legislation

The provision of compensation for industrial accidents has had important indirect results in reducing the number and severity of accidents. Safety programs and legislation look more directly to the prevention of industrial accidents and exist to a greater or less extent in all branches of transportation. It should be noted that, while some of the hazards peculiar to transportation affect both passengers and employees alike, there are others which are directly related to the requirements of particular transportation occupations.

In the railroad industry, as in other branches of transportation, a large part of the program of accident prevention stems from the voluntary efforts of employers and employees. Thus, the Association of American Railways maintains a Safety Section, while several other sections of the Association are engaged directly or indirectly in safety work. Voluntary safety programs are supplemented and often made more effective by State and Federal legislation. The Interstate Commerce Commission administers the various safety laws applicable to the railroad industry and to motor-vehicle transportation. Of principal importance to railroad employees are the Safety Appliances Acts, first enacted in 1893; the Hours of Service Act, of 1907; the Locomotive Boiler Inspection Act, first enacted in 1911; and the Automatic Train Control and Stop Devices provisions added to the Interstate Commerce Act in 1920. Many amendments and additions have been made to these laws since their first enactment. The Interstate Commerce Commission also maintains a system of accident reporting, covering passengers, employees, and property damage. In the fiscal year ended June 30, 1941, the Commission spent more than $1,000,000 for railroad safety.

Several States have enacted laws requiring a "minimum-crew" for the operation of trains, and laws limiting train length.[63] Railroad labor organizations have supported full-crew and train-limit laws as a means of promoting the safety of employees and passengers and

[60] *Ibid.*, pp. 5 and 6.

[61] *System of Workmen's Compensation for Seamen*, S. Doc. No. 113, 77th Cong., 1st sess., 1941.

[62] *Ibid.*, p. 8.

[63] See "Railroad Legislation on Full Crew, Personnel, and Train Lengths," *Monthly Labor Review*, June 1940, pp. 1429–1434; and *State Railroad Laws Relating to Full Crew, Qualifications of Personnel, Train Lengths*, Brotherhood of Locomotive Firemen and Enginemen, 1939.

in the interest of employment. Railroad management has opposed regulation of this sort and has contended that full-crew and train-limit laws merely represent attempts on the part of the railroad unions to preserve jobs for their members and are wholly unrelated to the safety of operation of railroads.

The first full-crew law was enacted in Arkansas in 1907. Similar laws are now on the statute books of more than 20 States. A case involving the Arkansas law reached the Supreme Court in 1911. In a decision upholding the law the Supreme Court said:

> It is not too much to say that the State [Arkansas] was under an obligation to establish such regulations as were necessary or reasonable for the safety of all engaged in business or domiciled within its limits * * * The statute here involved is not in any proper sense a regulation of interstate commerce, nor does it deny the equal protection of the laws. Upon its face, it must be taken as not directed against interstate commerce but as having been enacted in aid, not in obstruction, of such commerce and for the protection of those engaged in such commerce * * *[64]

The Court reasserted this rule in 1916 when the statute in question was one requiring certain minimum crews to be used for switching purposes on Arkansas railroads over 100 miles in length. The same objections were advanced as in the earlier case. All objections were overruled by the Court, and the statute held constitutional.[65] In 1930 the Missouri Pacific Railroad brought suit to enjoin the enforcement of the Arkansas full-crew law. The case reached the Supreme Court, and the constitutionality of the legislation was again affirmed.[66] Several State legislatures have repealed their full-crew laws; and in some cases have later reenacted them. In November 1939 the Supreme Court of Pennsylvania declared the full-crew law of that State unconstitutional[67] as a result of a suit brought by the Pennsylvania Railroad Company.

Laws limiting the number of cars in a railroad train have been very few (Arizona, 1912; Nevada, 1935; Louisiana, 1936; Oklahoma, 1937). All of the laws limit the number of freight cars in a train and, in addition, the laws of Arizona and Louisiana limit passenger trains to 14 and 16 cars, respectively. In 1933 the United States District Court for the District of Arizona held that State's train-length law invalid on the basis that the subject is "national in its character, requiring uniformity of regulation, and that the power to so regulate is exclusively conferred upon Congress by the commerce clause of the Constitution."[68] When the case, however, was taken to the United States Supreme Court it was dismissed on technical grounds without consideration of the merits.[69] Recently, the Arizona train-length law was declared unconstitutional and void by the Superior Court of Arizona.[70] Restraining orders have been issued by the Courts in the case of Nevada and Louisiana, but Oklahoma still enforces its law.[71]

Full-crew and train-limit bills have been introduced in Congress from time to time, but so far have failed of enactment. Fair consideration of the merits of such measures is difficult because their safety aspects are not easily separated from their results in preserving jobs. Solely as a means of safeguarding employment, they are not in the public interest, since the shipping public is entitled to the most efficient transportation service at the lowest cost consistent with safety, fair labor standards, and fair returns to investors. There are other and better ways of meeting problems of employment and unemployment.

As safety measures full-crew and train-limit laws deserve serious consideration. If they are essential to safe operations, their possible effects on employment are irrelevant, but they should be judged entirely upon their merits as safety legislation. Such an appraisal cannot be made by a layman, but requires the scientific judgment of technical experts. A problem of labor relations is created only if either labor or management proves unwilling to abide by the judgment of competent safety engineers.

The Motor Carrier Act (Part II of the Interstate Commerce Act) gives the Interstate Commerce Commission power to issue safety regulations for motor carriers, including private as well as common carriers. Safety regulations applicable to common and contract carriers by motor vehicle have been in effect since 1937, and to private carriers since 1940.[72] These regulations cover driver qualifications, methods of operation of vehicles, safety equipment, hours of service, inspection and maintenance, transportation of dangerous articles, and accident reporting. The Interstate Commerce Commission has pointed out that the regulatory authorities of forty States had adopted part or all of the Commission's motor carrier safety regulations and applied them to vehicles engaged in intrastate commerce.[73]

In water and air transportation the problem of safety to employees is also closely tied in with the problem of safety to passengers and property. In air transporta-

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[64] *Chicago, Rock Island and Pacific Railway Company* v. *State of Arkansas*, 219 U. S. 453 (1911).

[65] *St. Louis, Iron Mountain and Southern Railway Company* v. *State of Arkansas*, 240 U. S. 518 (1916).

[66] *Missouri Pacific Railroad Company* v. *Norwood*, 283 U. S. 249 (1931); *Missouri Pacific Railroad Co.* v. *Norwood*, 290 U. S. 600 (1933).

[67] *Pennsylvania R. R. Co.* v. *Driscoll*, 9 Atl. (2nd) 621 (1939).

[68] *Atchison, Topeka & Santa Fe Ry. Co.* v. *La Prade*, 2 F. Supp. 855 (1933).

[69] *Ex parte La Prade*, 289 U. S. 444 (1933).

[70] *Traffic World*, February 21, 1942, p. 507.

[71] *Southern Pacific Co.* v. *Mashburn, Attorney General*, 18 Fed. Supp. 393 (1937). *Train Lengths* (S. 69), Hearings before the Committee on Interstate and Foreign Commerce, House of Representatives, 75th Cong., 3d sess., 1938, pp. 469–470.

[72] *Motor Carrier Safety Regulations*, Revised, Interstate Commerce Commission, 1941.

[73] Interstate Commerce Commission, *54th Annual Report*, 1940, p. 115.

tion the Civil Aeronautics Board and the Administrator of Civil Aeronautics have broad powers over safety matters. In general, the former is the rule-making and the latter the enforcement authority. Safety regulations for the air-transportation industry cover qualifications of personnel, including certain classes of ground personnel as well as pilots, inspection and certification of equipment, air-traffic rules, operation and maintenance of aids to navigation, and the investigation of accidents.[74] The Civil Aeronautics Board and the Administrator also assist the air lines in the development of cooperative voluntary safety programs which supplement these safety regulations.

In water transportation the Bureau of Marine Inspection and Navigation of the Department of Commerce has somewhat similar broad powers of matters relating to safety. Federal authority covers certification of seagoing personnel, aids to navigation, inspection of equipment, operating practices, and the investigation of accidents.[75] As in air transportation, Federal safety legislation affecting employees is more largely concerned with employees who operate the means of transport than with other groups in the labor force. There is, however, a large volume of State factory legislation dealing with safety matters which covers many other classes of transportation employees.

Protection to Sick and Disabled Employees

The question of protecting workers against the wage losses due to sickness through some form of health insurance on a cooperative basis is still too new in the United States to establish definitely the lines of common employer-employee interests. Some parts of the transportation industry, notably the railroads, have already devloped programs of sick benefits and cooperative medical care on a voluntary basis.

Many of the larger railroads maintain relief departments, supported by assessments upon employees, which make regular payments to these employees during periods of sickness. Many railroads also maintain hospital associations, supported by employee contributions, which provide nearly complete medical care in hospitals owned and operated by the associations. Similar programs have recently been inaugurated in parts of the air transport industry.

Seamen are in a more favored position than any other class of transportation employees as regards medical care. Under admiralty law they have the right to maintenance, quarters, and medical treatment, as well as wages for a reasonable period, if they become sick or disabled during a period of employment. Under Federal statute seamen have a right to free medical care at the expense of the Federal Government after ships articles have been terminated.

It is perhaps too early to define precisely the limits within which the protection of workers from the results of sickness may be expected to take shape. It is not too soon to include the principle involved within the sphere of common employer-employee interest. Men and management have already shown a high degree of cooperative spirit in attacking this problem in certain sections of the transportation industry. It is not unreasonable to hope that the same spirit will be manifest when, as is sure to happen, more comprehensive programs for dealing with the problem of sickness are under consideration.

Protection Against Insecurity in Old Age

There are few social questions as little subject to debate in principle as the necessity of making adequate provision for workers after they become too old to occupy a place in industry. Private pension plans in the railroad industry and elsewhere forecast this development many years ago. At the time of the passage of the Railroad Retirement and Social Security Acts, pensions were provided generally in the railroad industry and in pipe-line transportation, by some companies engaged in water transportation, and by a number of industrial and mercantile establishments. Air transport and bus and truck companies had not by that time arrived at sufficient maturity to give attention to the problem of old age.

At the present time substantially all transportation workers are covered by Federal pension legislation—railroad workers by the Railroad Retirement Acts of 1935 and 1937, and others by the Social Security Act of 1935 as amended in 1939. Seamen were not included under the old-age provisions of the Social Security Act until 1939. The self-employed are not covered, however, and there are many thousands of workers in this category in motor-truck transportation.

Pay-roll taxes are larger under the Railroad Retirement Act than under the Social Security Act and benefits are generally larger. Under the Railroad Retirement Act employers and employees each pay 3 percent of compensation to employees, excluding amounts in excess of $300 per month. In 1943 the tax increases to 3¼ percent, in 1946 to 3½ percent, and in 1949 to 3¾ percent. Under the old-age provisions of the Social Security Act employers and employees each pay 1 percent of compensation, excluding amounts in excess of $3,000 per year. The tax will increase to 2 percent in 1943, 2½ percent in 1946, and 3 percent in

[74] Puffer, Claude E., *Air Transportation*, 1941, Chapter XI.

[75] See *Navigation Laws of the United States, 1940*, U. S. Department of Commerce. It should be noted that the regulatory authority over domestic water carriers which was given to the Interstate Commerce Commission by Part III of the Interstate Commerce Act does not include authority over safety matters.

1949. The total tax collected therefore amounts at the present time to 6 percent under the Railroad Retirement Act and 2 percent under the Social Security Act. In 1949 the total tax will amount to 7½ percent and 6 percent, respectively.

Both the Railroad Retirement and Social Security Acts provide for the payment of annuities based on service and compensation but the formulas used to determine annuity amounts differ greatly. The Railroad Retirement Act permits maximum annuity payments of $120 per month at the present time and provides for a varying minimum up to $40 per month depending upon average earnings, to individuals with 20 years of service who are employees at age 65. The maximum annuity payable under the Social Security Act is $85 per month but the formula is such that this maximum can never be reached by an individual without dependents. There is a minimum of $10 per month to individuals otherwise eligible which increases to $15 if there is one eligible dependent and $20 if there are two or more. As of January 1, 1941, the average annuity being paid under the Railroad Retirement Act amounted to $65.65 per month and the average under the Social Security Act, $22.71 per month to retired workers who were single or whose wives were under 65 and $36.45 per month to retired workers and their wives if both were aged 65 or over. Average payments under the latter act will gradually increase as additional service and compensation are accumulated so that the difference between average monthly payments under the two acts will become less. Under the Social Security Act service and earnings' credit used for computing annuities begins with the year in which taxes are first paid to the account of an employee. Under the Railroad Retirement Act, on the other hand, service and earnings are credited for service rendered before as well as after the effective date of the act, except that where prior service is counted the total service period cannot exceed 30 years. The Social Security Act originally provided a period of 5 years for taxes to be accumulated before benefits could become payable—the period from 1937 to 1942, but was amended in 1939 to permit benefit payments beginning January 1, 1940. Under the provisions of the Railroad Retirement Act benefits became payable immediately.

Both acts provide for retirement at age 65, which is not, however, compulsory. In addition the Railroad Retirement Act permits retirement between 60 and 65 to employees who have either completed 30 years of service or become totally and permanently disabled. Such annuities are reduced by $\frac{1}{180}$ for each calendar month the employee is under age 65 at the time of retirement. Employees totally and permanently disabled with 30 years of service may retire at any age on full annuities. Both retirement acts provide for annuity payments to survivors. Under the railroad act this is an elective feature which, subject to certain restrictions, permits an employee to choose a reduced annuity during his lifetime so that his spouse may receive an annuity after his death. Survivor benefits are not elective under the Social Security Act but are an integral part of the retirement system. The problem of making more adequate provision for survivors under the Railroad Retirement Act still remains to be solved.

Under the Railroad Retirement Act individuals who have credited earnings after December 31, 1936, never forfeit the annuity or death benefit rights thus acquired. In other words, eligibility for benefits is independent of the amount of wage and service credits, although these determine the amount and, in some cases, the type of benefit payable. Eligibility for benefits under the Social Security Act, on the other hand, depends upon the number of quarters in which the individual earned $150 or more in covered employment. No payment of any kind is made to individuals who fail to meet these eligibility requirements.

Under the Railroad Retirement Act the pensions paid to employees under the private pension plans which were widespread in the industry were taken over by the Railroad Retirement Board as of July 1937. The Social Security Act contains no comparable provision.

It may be assumed that it is in the common interest of both employers and employees in the transportation industry that adequate pensions be paid to aged employees. It is also in their common interest that the cost burden should be fairly distributed among the several transportation agencies. At the same time, the assumption by the railroad retirement system of the pensions previously granted railroad workers under company pension plans has meant that the additional costs of the currently higher taxes under the Railroad Retirement Act are not as great as the difference in tax rates between the two systems would seem to indicate. If Federal contributions should be established in the future as a means of supplementing the taxes levied to support annuity payments, proportionate contributions should be made under both systems.

Summary

About 2¼ million persons are employed on the average in the for-hire transportation industry in the United States. National transportation policy must be pointed not only to furnishing the public with efficient transportation service at a reasonable cost but to maintaining the economic well-being of this army of employees. The extent to which it is possible for

the industry to provide high wages, good working conditions, and economic security is, to an important degree, a measure of its economic health. The problem is not only one of production, of costs, of competition, and finance. It is also a problem of labor relations, of extending as far as possible the area of common understanding between employers and employees and of providing practical and fair solutions of the difficulties which arise out of conflicting interests.

The areas of interest within which employers and employees have been able to arrive at reasonable understandings have greatly widened in recent years. In varying degree this is true of all branches of transportation, whether by rail, by water, by air, by motor vehicle, or by pipe line. National transportation policy should be pointed toward extending this area of common understanding as far as possible throughout every branch of the industry and toward the stabilization of the labor standards of all at the level of the highest that is economically possible. The present report attempts to make some contribution to these ends by surveying briefly the labor standards of the several branches of transportation and indicating some points at which changes would seem to be desirable.

The widespread acceptance of the 8-hour day in the transportation industry has removed many questions as to scheduled hours of work from the field of employer-employee controversy. This acceptance has come more recently in water, bus and truck, and air transportation than in the railroad industry and it is by no means complete even in the latter. At the same time, it can be said that there is general agreement in the transportation industry on the desirability of the 8-hour day, while in pipe-line transportation, and among longshoremen and air pilots even shorter work schedules have been agreed upon.

The wage problem in the transportation industry is in part one of eliminating disparities as between the several transport agencies and as between various enterprises within the same agency. Such comparable data as are available indicate that these wage disparities are much less at the present time than they were 7 and 8 years ago. The wage rates in pipe-line transportation are, however, still higher than in other transport agencies. In water transportation, in the unionized portions of the bus and truck industry, and among certain classes of ground personnel of air lines, wage rates have increased faster during the last few years than in the railroad industry. This development has brought the wage standards of these four branches of the transportation industry somewhat more closely together. The statutory minima established by the Fair Labor Standards Act have eliminated certain areas of relatively low wages in the industry. Further progress in eliminating low wage areas through the effective operation of this act is to be expected. The business and price increases that are accompanying the progress of the defense program have given rise to demands for higher wage rates in the transportation industry, but these have occurred too recently to have been analyzed in this report.

Acceptance of the right to collective bargaining has spread rapidly in the transportation industry in recent years as union organization has increased in strength in those sections of the industry where it was formerly weakest. The gap between the railroad industry and other transportation agencies in this respect has been greatly lessened. The acceptance by management and the public of labor's right to bargain collectively in advancing its interest is essential to good labor relations. The furtherance of effective collective bargaining should be included as one of the major aims of national transportation policy as it is related to labor problems.

National transportation policy must also be directed toward the long-run economic security of transportation employees. There are five major protections to economic security which have been developed to a greater or less extent in almost every branch of the industry. These are: (1) protection in the right to hold a job; (2) protection against the wage losses of unemployment; (3) protection from the results of industrial accidents; (4) protection from the wage losses of ill health; and (5) protection against insecurity in old age. Some of these have been started on a voluntary basis by employers and employees. The most important have come about through the enactment of State and Federal legislation. For a long time to come there will be disagreement as to the exact means of attaining these objectives. But there is increasingly less disagreement as to the right of every worker to be protected from major economic insecurities as a fair return, in addition to his wages, for his contribution to production.

This chapter has not included specific discussion of the subject of labor-management cooperation in the more technical meaning of that phrase.[76] Yet, in a sense, the principal aim of the chapter has been to outline a background of fact and policy as to the position of labor in the transportation industry upon which any program of labor management cooperation, in the largest sense, must be based. The spirit of labor-management coop-

[76] For discussion of problems of labor management cooperation, in the railroad field, see Beyer, Otto, *Experiences with Cooperation Between Labor and Management in the Railway Industry*, 1928; and Slichter, Sumner, *Union Policies and Industrial Management*, 1941, Chapters XV and XVI.

eration should embrace the entire field of labor relations and need not be restricted to a consideration of production methods and practices.

Transportation is a great cooperative enterprise in the success of which employers, employees, investors, and the public share both an interest and a responsibility. Where their interests diverge, problems are created which must be solved in the spirit of the greatest good to the greatest number. Such solutions require a willingness to cooperate and to compromise when compromise is necessary, and a recognition of the fact that rights and duties cannot be separated from each other.

Furthermore, the conduct of labor relations requires a professional attitude on the part of labor and management representatives which, in some sections of the transportation industry, is distinguished by its rarity. The growth of labor unions has tended to take labor relations, on the employee side, out of the hands of amateurs. The personnel departments of many transportation companies do not show a corresponding development. Their objectives are often too limited, their staffs insufficiently trained and specialized. Labor-management cooperation in its broadest sense can be most successfully carried out if the problems of employer-employee relations are handled by men whose knowledge, experience, and foresight reflect the standards of judgment and pride of work which normally characterize professional activity.

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